NEC

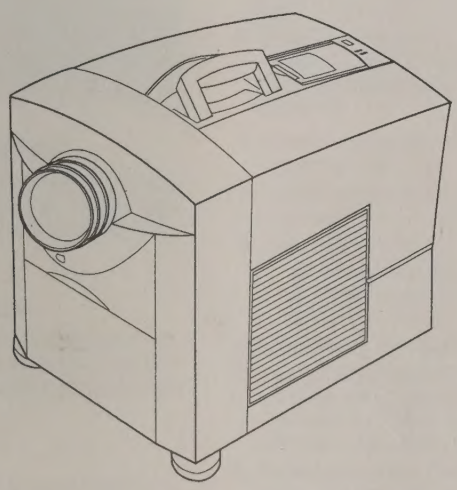
MODEL LCD MT
LCD MTg

LCD Projection Monitor

SERVICE MANUAL

PART NO. 399910828

Better Service
Better Reputation
Better Profit



SAFETY CAUTION:
Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notice" in this Service Manual.
* For continued X-radiation protection, replace picture tube with original type or NEC approved equivalent type.

WARNING:
SHOCK HAZARD - Use an isolation transformer when servicing

NEC Corporation
TOKYO, JAPAN

CAUTION

RISK OF ELECTRIC SHOCK.
DO NOT OPEN.

CAUTION: TO PREVENT ELECTRIC SHOCK, DO NOT OPEN THE CABINET. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol warns the user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any part inside of this unit.

This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.

WARNING

TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. ALSO DO NOT USE THIS UNIT'S POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLETS, UNLESS THE PRONGS CAN BE FULLY INSERTED. REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH-VOLTAGE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

DOC compliance Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out as in the Radio Interference Regulations of the Canadian Department of Communications.

Important Safeguards

The following are important safety instructions designed to ensure the long life of your LCD projector and to prevent fire and shock hazards. Be sure to read these safety instructions carefully and follow all warnings given below.

Installation

1. For optimal operation, use the LCD projector in a darkened room.
2. Place the LCD projector on a flat, level surface and in a dry area free from dust and moisture.
3. Do not place the LCD projector in direct sunlight, near stoves or other heat radiating appliance.
4. Smoke, steam and exposure to direct sunlight could adversely affect the internal components.
5. Avoid rough handling when moving your LCD projector as a strong shock could damage its internal components.
6. Do not place heavy objects on the top of the LCD projector.
7. If installing the LCD projector on the ceiling, observe the following the instructions:
   a) The ceiling must have sufficient strength to support the LCD projector's weight and must be installed in accordance with local building codes.
   b) The LCD projector must be installed by trained personnel.

Power Supply

1. The LCD projector is designed to operate on 120 V 60 Hz AC power supply. Make sure your local power supply matches these requirements before operation.
2. Handle the power cable carefully and avoid excessive bending. A damaged cord may cause electric shock or fire.
3. If the LCD projector is not to be used for an extended period, remove the plug from the power outlet.

Cleaning

1. Unplug the LCD projector from the power outlet before cleaning.
2. Clean the cabinet periodically with a soft cloth. If heavily stained, use a mild detergent solution. Never use strong detergents or solvents such as alcohol or thinner to clean your LCD projector.
3. Use a commercially available blower or lens cleaning paper to clean the lens.
4. Do not hit or scratch the lens surface as flaws on the lens surface may result.
5. Clean the air filter each 100 hour interval.
   a) Clean the outside only with a vacuum cleaner.
   b) Do not clean the air filter with water or any liquid.
   c) Do not operate the LCD projector without the air filter.

Fire and Shock Precautions

1. Adequate ventilation must be provided to prevent heat build-up inside the LCD projector. Make sure the ventilation holes are unobstructed. Place the LCD projector more than four inches(10 cm) from the surroundings such as walls.
2. Keep the inside of the LCD projector free from foreign objects, such as paper clips, nails, and papers. Do not attempt to retrieve such objects yourself or insert metal objects such as wire and screw-drivers inside the LCD projector. If a hazardous object falls inside the LCD projector, unplug it immediately and call a qualified service person for removal.
3. Do not set liquids on top of the LCD projector.

Others

Do not look into the lens as this could damage your eyes.

ATTENTION

RISQUE D'ELECTROCUTION
NE PAS OUVRIR

ATTENTION: AFIN DE REDUIRE LES RISQUES D'ELECTROCUTION, NE PAS ENLEVER LE COUVERCLE. AUCUN DES ELEMENTS INTERNES NE DOIT ETRE REPARE PAR L'UTILISATEUR. LAISSER A UN PERSONNEL QUALIFIE LE SOIN DE REPARER CET APPAREIL.

Ce symbole a pour but de prévenir l'utilisateur de la présence d'une tension dangereuse, non isolée se trouvant à l'intérieur de l'appareil. Elle est d'une intensité suffisante pour constituer un risque d'électrocution.
Eviter le contact avec les pièces à l'intérieur de cet appareil.

Ce symbole a pour but de prévenir l'utilisateur de la présence d'importantes instructions concernant l'entretien et le fonctionnement de cet appareil. Par conséquent, elles doivent être lues attentivement afin d'éviter des problèmes.

AVERTISSEMENT

AFIN DE REDUIRE LES RISQUES D'INCENDIE OU D'ELECTROCUTION, NE PAS EXPOSER CET APPAREIL A LA PLUIE OU A L'HUMIDITE. AUSSI, NE PAS UTILISER LA FICHE POLARISEE AVEC UN PROLONGATEUR OU UNE AUTRE PRISE DE COURANT SAUF SI CES LAMES PEUVENT ETRE INSEREES A FOND. NE PAS OUVRIR LE COFFRET, DES COMPOSANTS HAUTE TENSION SE TROUVENT A L'INTERIEUR. LAISSER A UN PERSONNEL QUALIFIE LE SOIN DE REPARER CET APPAREIL.

Notice de conformité DOC

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique établi par le Ministère des Communications du Canada.

Importantes précautions de sécurité

Les points suivants sont des précautions de sécurité importantes destinées à garantir une longue durée de service du projecteur à écran à cristaux liquides (LCD) et afin d'éviter un incendie et des risques d'électrocution. S'assurer de lire attentivement ces précautions de sécurité et respecter tous les avertissements décrits ci-dessous.

Installation

1. Pour un fonctionnement optimal, utiliser le projecteur à écran à cristaux liquides (LCD) dans une pièce sombre.
2. Placer le projecteur à écran à cristaux liquides (LCD) sur une surface à niveau et dans un endroit sec exempt de poussières et d'humidité.
3. Ne pas placer le projecteur à écran à cristaux liquides (LCD) en plein soleil, près de poêles ou d'autres appareils de chauffage.
4. La fumée, la vapeur et l'exposition aux rayons directs du soleil risquent de détériorer sérieusement les composants internes.
5. Eviter des manipulations brusques lors du déplacement du projecteur à écran à cristaux liquides (LCD), car un choc violent pourrait endommager les composants internes.
6. Ne pas poser des objets lourds sur le dessus du projecteur à écran à cristaux liquides (LCD).
7. Lors de l'installation du projecteur à écran à cristaux liquides (LCD) au plafond, respecter les instructions suivantes.
   a) Le plafond doit être suffisamment solide pour supporter le poids du projecteur à écran à cristaux liquides (LCD) et il doit être installé selon les codes de construction locaux.
   b) Le projecteur à écran à cristaux liquides (LCD) doit être installé par un personnel qualifié.

Alimentation

1. Le projecteur à écran à cristaux liquides (LCD) est conçu pour fonctionner à 120 V CA 60 Hz. S'assurer que la tension d'alimentation locale satisfait cette exigence avant d'utiliser le projecteur.
2. Manipuler le câble d'alimentation avec précaution et éviter de le plier excessivement. Un cordon endommagé risque de provoquer une électrocution ou un incendie.
3. Si le projecteur à écran à cristaux liquides (LCD) n'est pas utilisé pendant une période prolongée, retirer la fiche de la prise secteur.

Nettoyage

1. Débrancher le projecteur à écran à cristaux liquides (LCD) de la prise d'alimentation avant le nettoyage.
2. Nettoyer régulièrement le coffret avec un chiffon doux. S'il y a des taches tenaces, utiliser une solution d'un détergent doux. Ne jamais utiliser des détergents puissants ou des solvants, tel que l'alcool ou un diluant pour nettoyer le projecteur à écran à cristaux liquides (LCD).
3. Utiliser une brosse soufflante ou du papier de nettoyage de lentille disponible dans le commerce pour nettoyer la lentille.
4. Ne pas frapper ou rayer la surface de la lentille, car des défauts risquent de se produire sur la surface de la lentille.
5. Nettoyer le filtre à air toutes les 100 heures.
   a) Nettoyer seulement l'extérieur avec un aspirateur.
   b) Ne pas nettoyer le filtre à air avec de l'eau ou un liquide.
   c) Ne pas utiliser le projecteur à écran à cristaux liquides (LCD) sans le filtre à air.

Précautions pour éviter un incendie ou une électrocution

1. Une ventilation appropriée doit être assurée afin d'éviter une accumulation de chaleur à l'intérieur du projecteur à écran à cristaux liquides (LCD). S'assurer que les trous de ventilation ne sont pas obstrués. Laisser un espace d'au moins 10 cm (quatre pouces) entre le projecteur à écran à cristaux liquides (LCD) et les murs.
2. Eviter que des objets étrangers, des agrafes, des clous et du papier, par exemple, pénètrent à l'intérieur du projecteur à écran à cristaux liquides (LCD). Ne pas essayer de récupérer ces objets soi-même ou ne pas insérer des objets métalliques, des fils et des tourne-vis, par exemple à l'intérieur du projecteur à écran à cristaux liquides (LCD). Si un objet tombe à l'intérieur du projecteur à écran à cristaux liquides (LCD), le débrancher immédiatement et contacter un dépanneur qualifié pour retirer l'objet.
3. Ne pas placer des liquides sur le dessus du projecteur à écran à cristaux liquides (LCD).

Divers

Ne pas regarder dans la lentille, car cela risque de provoquer des lésions oculaires.

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SPECIFICATIONS

OPTICAL

LCD Panel	: 3-inch TFT active-matrix with 640 x 480 dots
Lens	: Manual zoom, F 5.0 f=105-165 mm
Lamp	: Metal halide lamp 250 W (expected life span 750 hours)
Image Size	: 40-150 inches diagonally
Projection Distance	: 6.23-16.4ft (1.9-5.0m)
Light Output	: 350 lumens, at peak white
Contrast Ratio	: Greater than 200
Color Temperature	: 9,000° Kelvin

ELECTRICAL

Inputs	: VIDEO (NTSC/PAL) RGB (H:15-35 kHz)
Video Bandwidth	: 30 MHz
Color Reproduction	: 16,777,216 color pixels. Dependent upon graphic card used.
Resolution	: VIDEO 500 TV lines (NTSC) RGB 640 dots horizontal ; 480 dots vertical
Y/C Separation	: NTSC 1 H Comb filter PAL Bandpass filter
Power Requirement	: 120 VAC, 60 Hz (LCD MT)/220-240VAC, 50/60Hz
Power Consumption	: 350 watts (LCD MT/LCD MTg)
Dimensions	: 11 1/4" (W) x 14 15/16" (H) x 21 5/8" (D) 286mm (W) x 379mm (H) x 535mm (D)
Net Weight	: 36.4 lbs/16.5kg
Speaker	: 1.2W (monaural)

Contents of the Package

Congratulations on your purchase of the MultiSync MT LCD projector ! The following lists all of the items included in your LCD projector package. Please save the original box and packing materials for future transportation or shipment of this LCD projector.

1. MultiSync MT LCD projector
2. Remote control unit with the cable.
3. PC/Mac MultiCable (15-pin mini D-sub to 15-pin D-sub connector)
4. Power cable
5. BNC to RCA adapter
6. Batteries SUM-3, 1.5V AA (2pcs)
7. User's manual
8. Important safeguards
9. Instructions sheet for lamp replacement

Features

- Easy to move or set-up. No need for convergence.
- Small LCD panels generate images 40 - 150 inches in size measured diagonally using zoom control.
- Can be installed for front, rear, floor and ceiling operation.*
- The 250 watt metal halide lamp and our original deflection transformer element make possible high light output
- 3-inch TFT LCD panel with digital gamma compensator produces more precise gradation.
- Accepts IBM VGA, Macintosh II, or other RGB signals within a horizontal frequency range of 15 to 35 kHz as well as NTSC and PAL standard video signals
- Detachable hand-held remote control with wireless or wired operation.
- Contemporary design that easily blends with the decor of any office, corporate auditorium or board room.

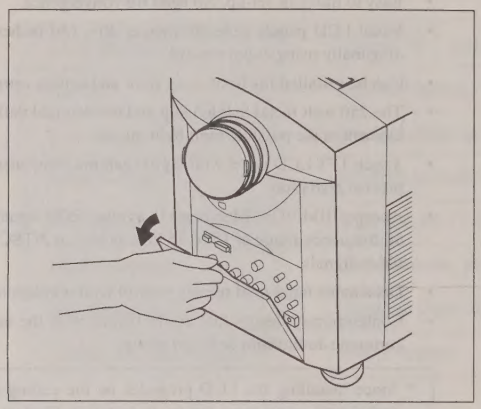
* Since installing the LCD projector on the ceiling requires special techniques, users must not try to install it. Contact your dealer for ceiling installation.

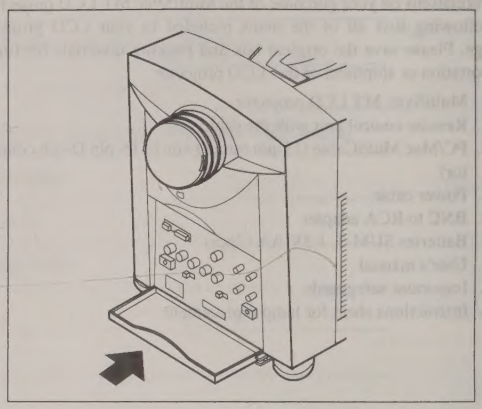
WARNING

When using RGB mode:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

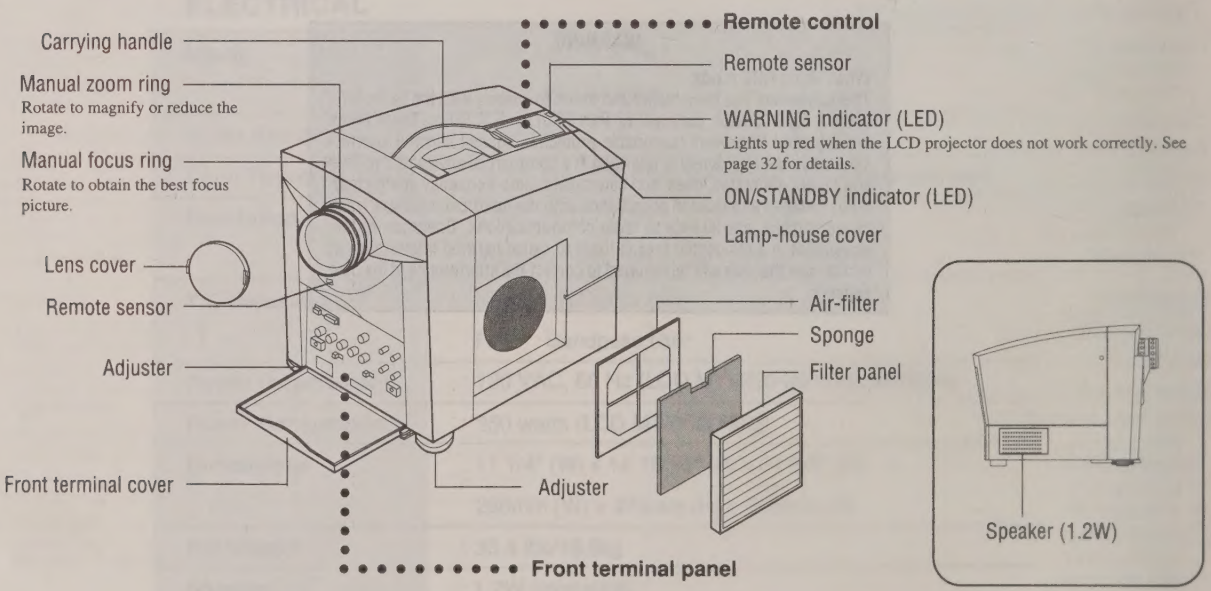
PART NAMES AND FUNCTIONS

Projector

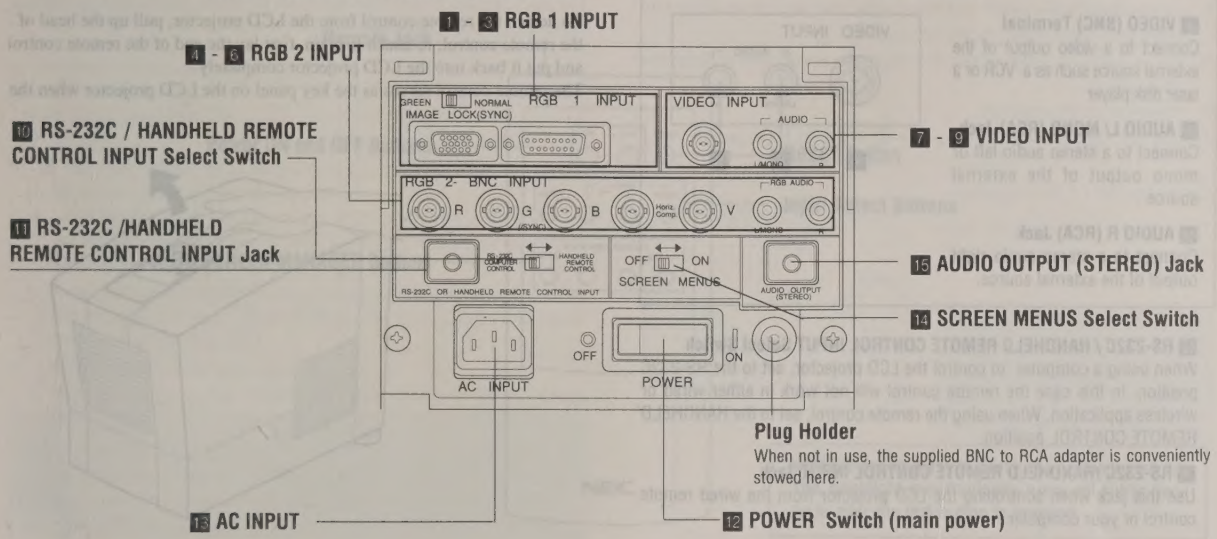




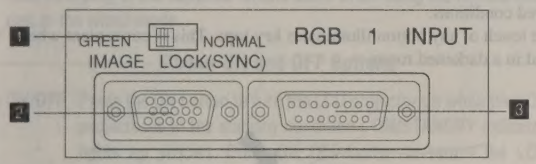
To open the front terminal cover to reveal the front panel, pull the cover down shown as the drawing. When not in use, the front terminal cover is conveniently stowed in a slot at the bottom of the LCD projector. Slide the cover in the tracks until it is stopped.



Front terminal panel



RGB 1 INPUT

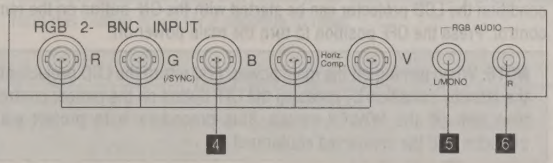


1 IMAGE LOCK (SYNC) Select Switch
Set to the GREEN position when connecting the 15-pin mini D-Sub connector with Macintosh II or compatible computers with sync on green signals. When using other computers with separate sync equipped with a 15-pin mini D-Sub connector, set to the NORMAL position.

2 15-pin mini D-Sub Connector
Connect to IBM or compatible computers , or Macintosh II or compatible computers. Note that when using the LCD projector with a Macintosh II, use the supplied NEC MultiCable and also set the IMAGE LOCK select switch to the GREEN position.

3 15-pin D-Sub Connector
Connect to IBM or compatible computers , or Macintosh II or compatible computers. Note that when using the LCD projector with an IBM or compatible computer, use the supplied NEC MultiCable.

RGB 2 INPUT



4 R, G(/ SYNC), B, Horiz./ Comp., and V (BNC) Terminals
Connect to R, G(or with sync), B, horizontal / composite sync , and vertical sync outputs of the external equipment such as a scan converter, a document camera, or a video camera.

5 RGB AUDIO L/MONO (RCA) Jack
Connect to a stereo audio left or mono output of the external equipment.

6 RGB AUDIO R (RCA) Jack
Connect to a stereo audio right output of the external equipment.

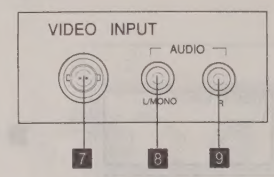
NOTE: RGB AUDIO L and R jacks are available for RGB 1 and 2 inputs.

VIDEO INPUT

7 VIDEO (BNC) Terminal
Connect to a video output of the external source such as a VCR or a laser disk player

8 AUDIO L/ MONO (RCA) Jack
Connect to a stereo audio left or mono output of the external source.

9 AUDIO R (RCA) Jack
Connect to a stereo audio right output of the external source.



10 RS-232C / HANDHELD REMOTE CONTROL INPUT Select Switch
When using a computer to control the LCD projector, set to the RS-232C position. In this case the remote control will not work in either wired or wireless application. When using the remote control, set to the HANDHELD REMOTE CONTROL position.

11 RS-232C /HANDHELD REMOTE CONTROL INPUT Jack
Use this jack when controlling the LCD projector from the wired remote control or your computer.

12 POWER Switch (main power)
Press to the ON position to turn the main power on. The LCD projector enters standby condition, and the ON/STANDBY indicator lights up yellow. In this condition the LCD projector can be started with the ON button on the remote control. Press the OFF position to turn the main power off.

NOTE: When turning off the main power, first return the LCD projector to the standby condition by pressing the OFF button on the remote control, then turn off the POWER switch. This procedure is to protect your projector and the connected equipment.

ON/STANDBY INDICATOR lights up green when the LCD projector starts up and lights up yellow when the LCD projector is in standby condition.

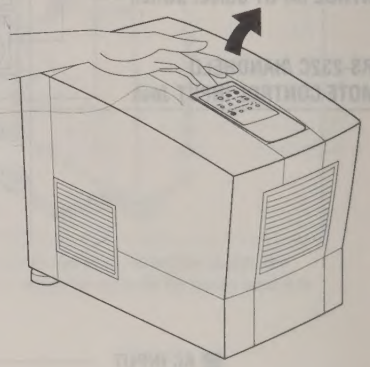
13 AC INPUT
Connect the supplied power cable' s three-pin plug here.

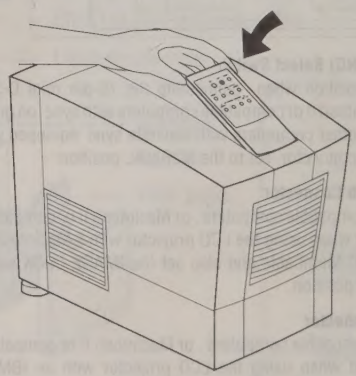
14 SCREEN MENUS Select Switch
Set to the ON position to display the on-screen message and set to the OFF position to eliminate the on-screen message.

15 AUDIO OUTPUT (STEREO) Jack
Connect to a stereo audio input of the external equipment such as stereo amplifier.

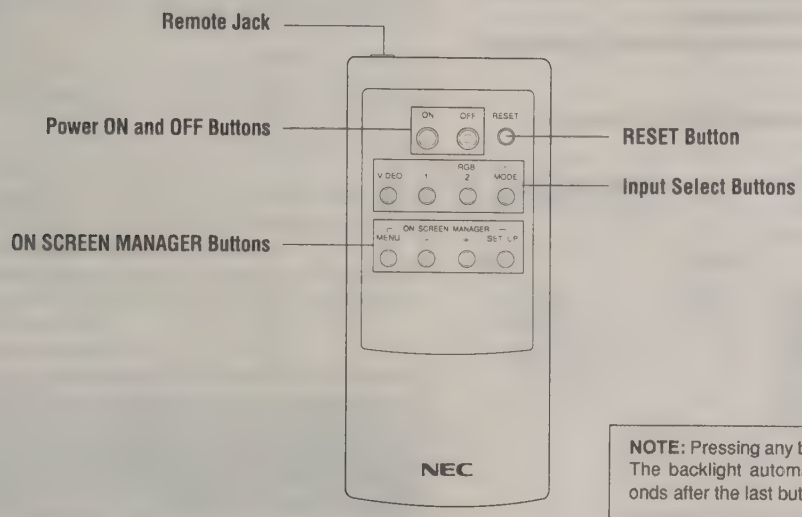
Remote Control / Control Panel

To detach the remote control from the LCD projector, pull up the head of the remote control; to attach it again, first lay the end of the remote control and put it back into the LCD projector completely.
The remote control serves as the key panel on the LCD projector when the remote is fit on the LCD projector. It also can be used in both wireless and wired conditions.
The touch of any button illuminates key tops. This is convenient when used in a darkened room.





The button functions are as follows:



NOTE: Pressing any button turns on the backlight. The backlight automatically turns off thirty seconds after the last button is pressed.

Remote Jack
Insert the plug of the supplied remote cable when using the remote control unit in the wired mode.

Power ON and OFF Buttons

ON/OFF Press the ON button to turn the LCD projector on when the LCD projector is in the standby condition (ON/STANDBY indicator lights up yellow). Press the OFF button to return the LCD projector to the standby condition.

ON SCREEN MANAGER Buttons

MENU Whenever this button is pressed, the volume and picture adjustment are sequenced as follows: VOLUME → BRIGHTNESS → CONTRAST → COLOR → TINT → SHARPNESS → VOLUME...

SET UP Whenever this button is pressed, the initial setting mode is sequenced as follows:PIXEL LOCK → IMAGE LOCK → H POSITION → V POSITION → LAMP TIMER → AUTO START → SET POSITION...

+ Press to increase the selected adjustment level .

- Press to decrease the selected adjustment level.

RESET Button
Resets the adjustment data and recalls initial data (the factory preset data). Hold this button down for 2 seconds to reset.

Input Select Buttons

VIDEO Press to display the equipment connected to the VIDEO input terminal (BNC type).

RGB Press to display the equipment connected to the RGB input as follows:

RGB 1 Press to display the equipment connected to the RGB 1 INPUT (15-pin D-Sub or mini D-Sub type) connector

RGB 2 Press to display the equipment connected to the RGB 2 INPUT (BNC/RCA type) terminals.

MODE Whenever this button is pressed, the RGB setting mode is changed as follows:

AUTO → VGA TEXT → OPTION1 → OPTION2 → OPTION3 → AUTO...:

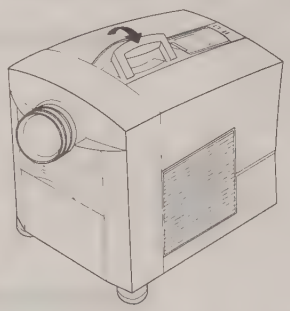
Installation Procedures

1. **Decide installation place and image size (See also "Projection Distance and Image Size" on the next page.)**
2. **Set up a screen (Prepare the screen) or use a wall with a flat matte white paint.**
3. **Place the LCD projector.**
4. **Connect the external video equipment to the LCD projector.**

Carrying the LCD Projector

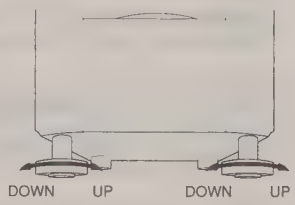
To move the LCD projector from room to room, use the carrying handle on the top.

NOTE: Before carrying the LCD projector, be sure to unplug the power cable and all the connected equipment.
Cover the lens with the lens cover.



Placing the LCD Projector horizontally

The bottom has adjustable feet for height adjustments. Adjust the height of the image with the adjusters so that the screen and the projected image are centered, and the bottom edge of the image is horizontal.
The adjusters allow about five degrees of vertical adjustment in maximum.



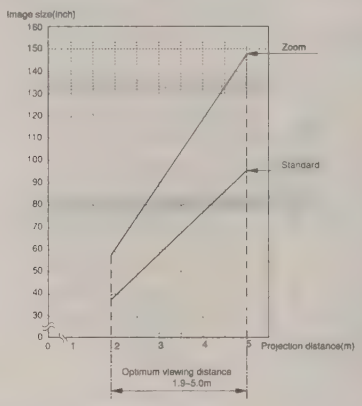
• Rotate the two adjusters for the appropriate tilt angle.

WARNING

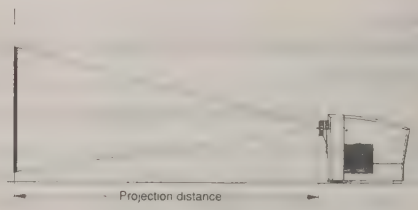
- Do not use the projector if it is not properly balanced. The LCD projector may fall, causing serious damage to it and serious injury to a person.
- Do not use the LCD projector in a place where a temperature can vary between high and low. The LCD projector must be used at the temperature 0 to 40 degrees C.
- When setting up the LCD projector and screen, be sure to avoid exposure to ambient light directly on the screen. Avoid adverse illumination on the screen from direct sunlight or florescent lighting fixtures.

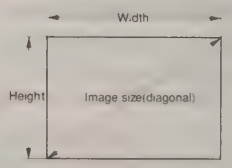
Projection Distance and Image Size

Use the following diagrams to determine the exact relation between desired image size and projection distance.



- The focal point is within the range of 6. 23 to 16. 4 ft.(1.9 to 5.0 m) from the lens to the screen. The LCD projector must be installed within this range of projection distance.





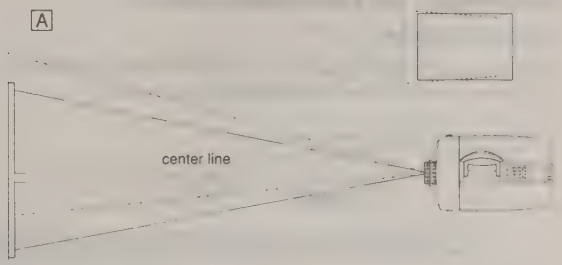
NOTE: Do not expose the LCD projector to moisture, dust, smoke and soot as this could adversely affect the lens system and projected image
Allow adequate ventilation around the LCD projector so that heat can properly dissipate. Do not cover the right side (inlet) and the rear (outlet) vents.

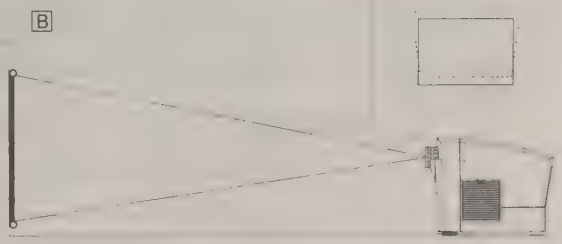
Normal Installation

1. Determine where to set up the LCD projector and the screen.
2. Connect one end of the power cable to the LCD projector and the other end to a power outlet.
3. Remove the lens cover.
4. Turn on the power.
   - The LCD projector will display a black-back screen if no input signal is present.
5. Position the LCD projector so that the screen and the center line of LCD projector are at the right angle to each other.
   - Move the front of the LCD projector horizontally to adjust the top and bottom lines of the projected image so they are straight and parallel to the screen edge. (Diagram A)
   - Adjust the center height of the image with the adjusters so that the screen and the projected image are centered, and the bottom edge of the image is horizontal. (Diagram B)
6. Magnify or reduce the projected image.
   - Increase or decrease the size of the projected image with the zoom ring.

WARNING

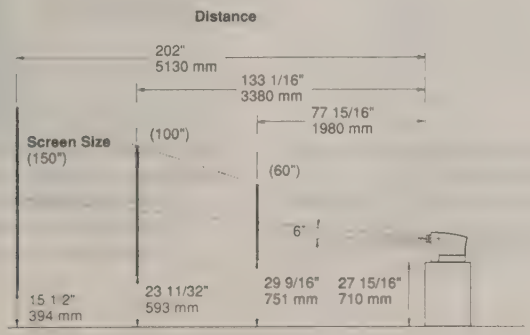
When placing the LCD projector on a table or stand, pay special attention that the LCD projector has a firm footing for support. Dropping the projector would not only be dangerous to the end user but would also damage the projector.





Example of Desk Top Projection

The drawing below shows the example in which the LCD projector is set up for 150" screen size with 6 degrees tilt in the horizontal position.

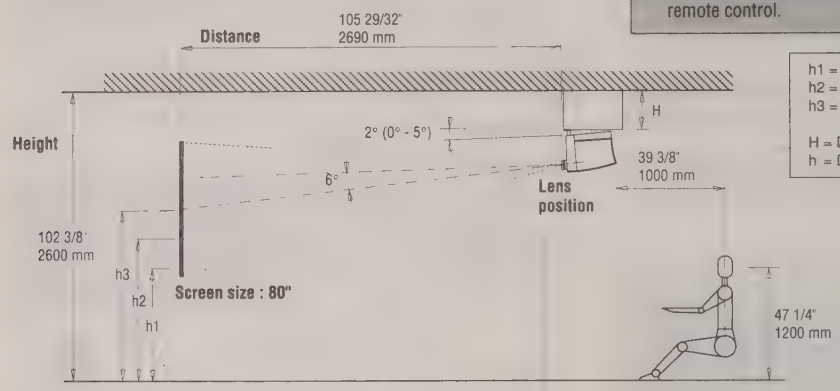


Installation for Your Application

Ceiling installation

When using the LCD projector for ceiling mount, use the SET UP button on the remote control to invert and turn the image as required.

Example of Ceiling Mount



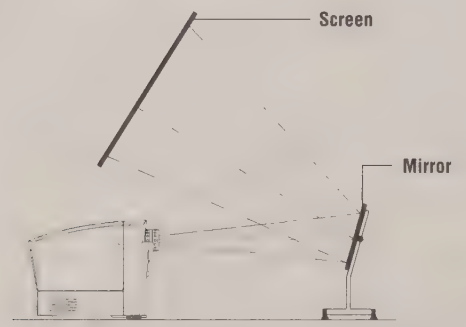
NOTE:

- The LCD projector must be installed on the ceiling by trained personnel. Consult your dealer for more information.
- The ceiling must have sufficient strength to support the LCD projector' s weight and must be installed in accordance with any local building codes.
- When using the LCD projector ceiling-mounted, do not attach the remote to the LCD projector. Dropping of the remote can cause damage to the remote control.

h1 = 45 11/16" (1160 mm) : H = 29 1/2" (750 mm)
h2 = 55 1/2" (1410 mm) : H =19 11/16" (500 mm)
h3 = 65 11/32" (1660 mm) : H = 9 27/32" (250 mm)

H = Distance between the projector bottom and the ceiling
h = Distance between the screen center and the floor.

Using a mirror



The illustration shows the relative position of the LCD projector with the screen when the LCD projector is used with a reflected mirror.
When using the LCD projector with a mirror, use the SET UP button on the remote control to reverse the image .

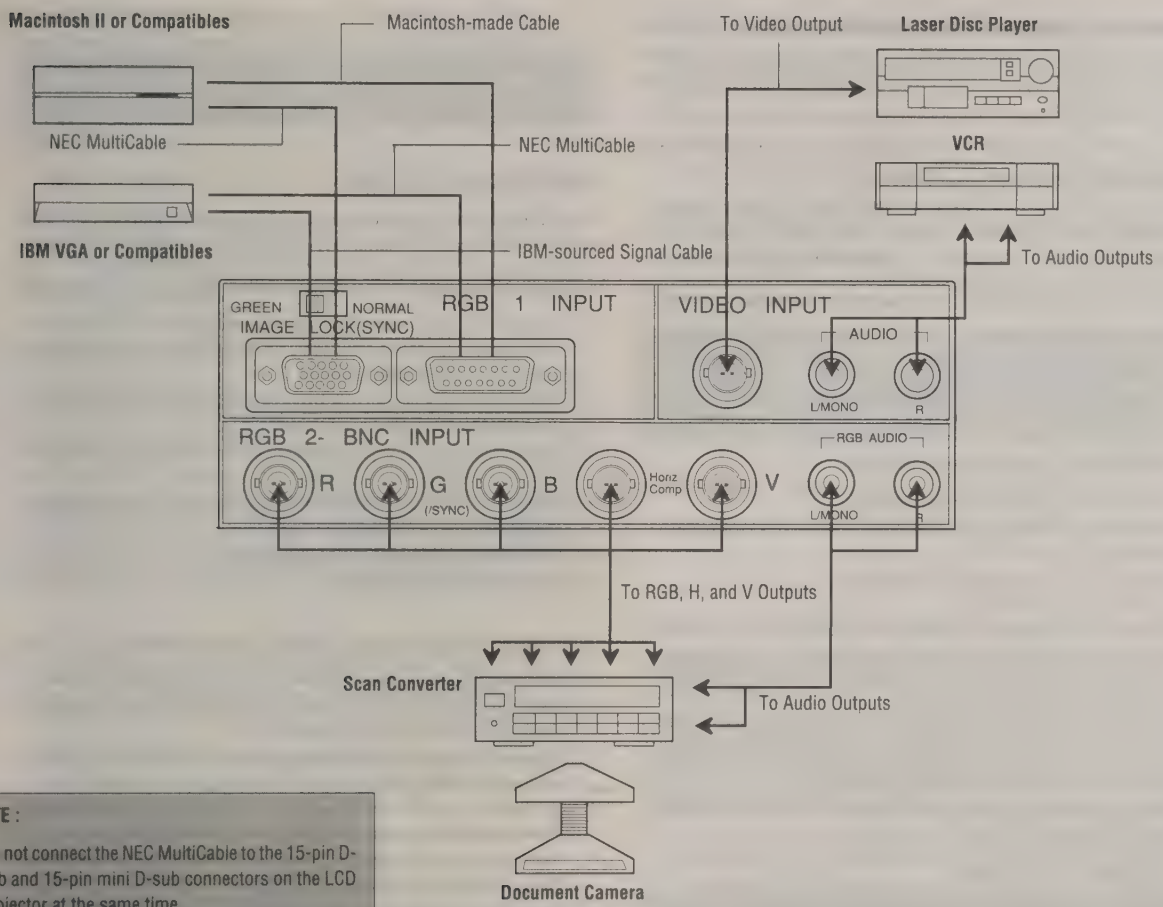
- Using a mirror saves the space for projection distance.

Using a transparent screen

The illustration shows the relative position of the LCD projector with the transparent screen when the LCD projector is used with it.

- The picture is viewed from the rear of the screen.
- When using the LCD projector with a transparent screen, use the SET UP button on the remote control to reverse the image .

TYPICAL CONNECTION EXAMPLE



NOTE :

- Do not connect the NEC MultiCable to the 15-pin D-sub and 15-pin mini D-sub connectors on the LCD projector at the same time.
- Use the supplied BNC to RCA adapter to connect the LCD projector's BNC terminal to an RCA terminal of the connected equipment such as a VCR.

Connection to Your Personal Computer

The LCD projector gives IBM and Macintosh II computers or compatible users large projected images. The following display standards are supported by the LCD projector:

VGA 640 × 480 for graphics	VGA 640 × 400 for graphics
VGA 640 × 350 for graphics	VGA 720 × 400 for text
VGA 720 × 350 for text	MAC II 640 × 480

With IBM PC (VGA) and compatibles

The LCD projector complements IBM computers and compatibles. To attach the LCD projector to an IBM PC, PC/XT, PC/AT, PS/2, or compatible computer equipped with a non-IBM VGA adapter or compatible graphics adapter, follow the instructions below.
When using the supplied NEC MultiCable accompanying the LCD projector:

1. The power must be turned off to the LCD projector and the computer.
2. If necessary, install the graphics board. For more information, refer to the manual accompanying the board.
3. Make sure the IMAGE LOCK switch on the front of the LCD projector is set to the NORMAL (right) position.
4. Connect the 15-pin mini D-sub (the smaller connector) end of the cable to the connector of the computer or the adapter.
5. Connect the 15-pin D-sub (the larger connector) end of the cable to the connector on the front of the LCD projector.
6. Connect one end of the supplied power cable to the LCD projector and the other end to the power outlet.
7. Turn on the LCD projector and the computer.
8. This completes the installation.

When using an IBM-sourced signal cable: (Not included with LCD MTg)

1. The power must be turned off to the LCD projector and the computer.
2. Make sure the IMAGE LOCK switch on the front of the LCD projector is set to the NORMAL(right) position.
3. Connect the 15-pin mini D-sub (the smaller connector) end of the IBM-sourced signal cable to the connector of the computer or the video card.
4. Connect the 15-pin mini D-sub (the smaller connector) end of the cable to the connector on the front of the LCD projector.
5. Connect one end of the supplied power cable to the LCD projector and the other end to the power outlet.
6. Turn on the LCD projector and the computer.
7. This completes the installation.

NOTE: For more information on the computer, refer to the user's manual accompanying it.

With the Macintosh II family

The LCD projector is compatible with the Macintosh II family of computers and the Macintosh LC. To attach the LCD projector to the Macintosh II family of computers and the Macintosh LC, follow the instructions below.
When using the supplied NEC MultiCable accompanying the LCD projector:

1. The power must be turned off to the LCD projector and the computer.
2. Make sure the IMAGE LOCK switch on the front of the LCD projector is set to the GREEN (left) position.
3. Connect the 15-pin D-sub (the larger connector) end of the cable to the connector of the computer or the video card.
4. Connect the 15-pin mini D-sub (the smaller connector) end of the cable to the connector on the front of the LCD projector.
5. Connect one end of the supplied power cable to the LCD projector and the other end to the power outlet.
6. Turn on the LCD projector and the computer.
7. This completes the installation.

When using a Macintosh-made signal cable: (Not included with LCD MTg)

1. The power must be turned off to the LCD projector and the computer.
2. Make sure the IMAGE LOCK switch on the front of the LCD projector is set to the NORMAL (right) position.
3. Connect the 15-pin D-sub (the larger connector) end of the Macintosh-made signal cable to the connector of the computer or the video card.
4. Connect the 15-pin D-sub (the larger connector) end of the cable to the 15-pin D-sub (the larger connector) on the front of the LCD projector.
5. Connect one end of the supplied power cable to the LCD projector and the other end to the power outlet.
6. Turn on the LCD projector and the computer.
7. This completes the installation.

NOTE: For more information on the computer, refer to the user's manual accompanying it.

Connection When Controlling the LCD-Projector from Your Personal Computer Using the RS-232C COMPUTER CONTROL Terminal

The LCD projector can be controlled from your computer. Follow the instructions below:

1. The power must be turned off to the LCD projector and the computer.
2. Connect the RS-232C COMPUTER CONTROL jack of the LCD projector to the computer.
3. Set the RS-232C / HANDHELD REMOTE CONTROL INPUT select switch to the RS-232C position.
4. Turn on the LCD projector and the computer.
5. This completes the installation.

NOTE:
- Factory service function.
- Contact NEC Technologies service personnel for more information concerning this feature.
- Set to the HANDHELD REMOTE CONTROL position for normal operation.
- When using a computer to control the LCD projector, set to the RS-232C position. In this case the remote control does not work in either wired or wireless application. When using the remote control, set to the HANDHELD REMOTE CONTROL position.

Connection to a VCR or Laser Disc Player

To connect your VCR, laser disc player, follow the instructions below:

1. The power must be turned off to the LCD projector and the VCR or laser disc player.
2. Connect the video and audio outputs of the VCR or laser disc player to the VIDEO INPUT terminals (BNC) of the LCD projector with pin plug cables.
3. Connect one end of the supplied power cable to the LCD projector and the other end to the power outlet.
4. Turn on the LCD projector and the VCR or laser disc player.
5. This completes the installation.

NOTE:
- Pin plug cables are not included with the LCD projector.
- For more information on the VCR and laser disc player, refer to the user's manual accompanying them.

Connection to a Document Camera

The LCD projector works with a document camera. To attach your document camera, follow the instructions below:

1. The power must be turned off to the LCD projector and a document camera.
2. Connect the R, G, B, H, and V outputs (BNC) of the document camera to the R, G, B, Horiz./Compo. and V input BNC terminals of the LCD projector with a 5 BNC-5 BNC coaxial cable.
3. Connect one end of the supplied power cable to the LCD projector and the other end to the power outlet.
4. Turn on the LCD projector and the document camera.
5. This completes the installation.

NOTE:
- A 5 BNC-5 BNC coaxial cable is not included with the LCD projector.
- For more information on the document camera, refer to the user's manual accompanying it.

Connection to an IDC-2000 Scan Converter (Only LCD MT)

The LCD projector works with the NEC IDC-2000 scan converter (optional) which improves the quality of your video images and reduces NTSC artifacts such as line jitter, dot crawl and cross color. To attach your system to the LCD projector, follow the instructions below:

1. The power must be turned off to the LCD projector and the scan converter.
2. Connect the NTSC video source to the video inputs of the IDC-2000.
3. Connect the R, G, B, H, and V outputs (BNC) and the RGB audio outputs (RCA) of the IDC-2000 to the R, G, B, Horiz./Compo. and V input (BNC) terminals, and the RGB audio inputs (RCA) of the LCD projector with the 5 BNC-5 BNC coaxial cable accompanying the IDC-2000.
4. Connect one end of the power cable to the LCD projector and the other end to the power outlet.
5. Turn on the LCD projector and the scan converter.
6. This completes the installation.

NOTE:
- A 5 BNC-5 BNC coaxial cable is not included with the LCD projector.
- Refer to the IDC-2000 user's manual.

This chapter shows how to select an input, adjust the picture and sound, and perform other setting.

Basic Operation

The following instructions summarize the basic operation for the LCD projector.
Prior to operation, check that:

- The connected equipment is turned on the power.
- The lens cap is removed.

1. **Turn on the power to the LCD projector.**
   First, press the ON position of the mechanical POWER switch on the front of the LCD projector. The ON/STANDBY indicator lights up yellow. Then press the ON button on the remote control to start up the LCD projector. The ON/STANDBY indicator' s light turns green.
2. **Select the input.**
   Press the VIDEO, RGB, or MODE button on the remote control to select an input source.
3. **Adjust the focus.**
   Rotate the focus ring to adjust the focus for the best picture.
   Note that you need to complete the zoom adjustment prior to the focus adjustment.

To turn off the power, press the OFF button on the remote control first, then press the OFF position of the mechanical POWER switch on the front of the LCD projector to turn off the main power.

NOTE: When the LCD projector is not to be used for an extended period, remove the plug from the power outlet.

CAUTION: Do not unplug the power cable while the cooling fans are working. The cooling fans keep working as long as there is a high temperature inside the LCD projector in the standby condition.

Input Select

You can switch from one input to any other input source.
To switch the input:
Put the VIDEO, RGB, or MODE button to select an input source.
The buttons on the remote control correspond with the inputs as follows:

VIDEO: NTSC or PAL video input from VIDEO INPUT terminal — VIDEO

RGB 1: The input from the RGB 1 INPUT connector (15-pin D-sub or mini D-sub) — RGB 1

RGB 2: The input from the RGB 2 INPUT terminals (BNC and RCA) — RGB 2

RGB MODE: Whenever the MODE button is pressed, the RGB input is changed in this order: — RGB MODE AUTO

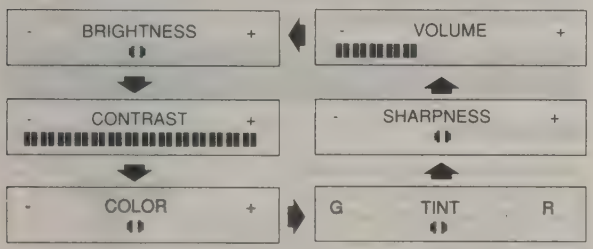
AUTO → VGA TEXT → OPTION 1 → OPTION 2 → OPTION 3 → AUTO...

When an RGB input is selected, the information appears on the screen.

Picture and Volume Control (MENU mode)

To adjust the picture and volume, follow the instructions below.

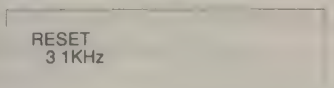
1. Press the MENU button on the remote control to select one of the adjustment items.
   - Whenever the button is pressed, the adjustment item(on-screen) changes as follows:



2. Press the + or - button to adjust the level of the selected item.
   - The on-screen bar graph appears on the screen when the SCREEN MENUS select switch is set to ON. The level of bar graph increases or decreases.
3. The adjustment data is stored and this completes the adjustment.
   - The data is not changed until you adjust it the next time.

To return to the factory preset level, press the RESET button on the remote control for 2 seconds.

- The on-screen message (e. g. "RESET 31. 5 KHz") is indicated in red when the SCREEN MENUS select switch is on. The on-screen will change from red to green. This completes resetting.



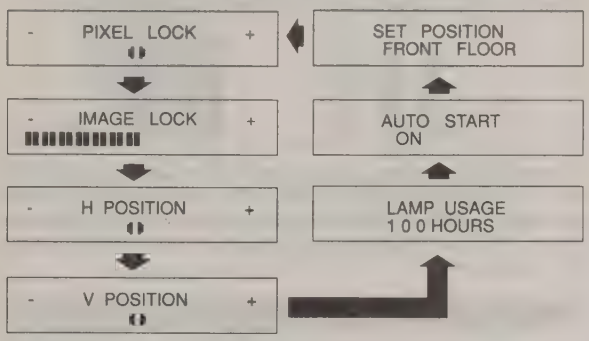
NOTE:
- BRIGHTNESS is reset for VIDEO and RGB inputs respectively.
- CONTRAST is reset for all inputs.
- COLOR and SHARPNESS are reset for VIDEO input only.
- TINT is reset for NTSC signal only.

NOTE: The COLOR, TINT, and SHARPNESS controls do not work for RGB signals. The TINT control does not work for PAL signals.

Set Up Adjustment (SET UP mode)

You can set various items for a new RGB input in this mode.

1. Press the SET UP button on the remote control to select one of the setup items.
   - Whenever the button is pressed, the setup item(on-screen) changes as follows:



   - The on-screen message (e. g. "- PIXEL LOCK+") is displayed when the SCREEN MENUS select switch is set to ON.
2. Press the + or - button to adjust the level of the selected item.
   - The on-screen bar graph appears on the screen. The level of bar graph increases or decreases.
3. The adjustment data is stored and this completes the adjustment.
   - The data is not changed until you adjust it the next time.

To reset the above setup item, press the RESET button on the remote control for 2 seconds.
Note that PIXEL LOCK, IMAGE LOCK, H. POSI, and V. POSI are returned to the factory preset level at the same time by pressing the RESET button.

NOTE: The SET POSITION setup item is not reset by pressing the RESET button.

NOTE: The PIXEL LOCK and the IMAGE LOCK adjustments do not work for VIDEO signals.

PIXEL LOCK

Adjusts the horizontal display size.
To do this, follow the instructions below.

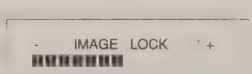
When the clock frequencies of the current signal is high, or the image area is too large to display, press the - button on the remote control to narrow the width. When the clock frequencies is low, press the + button to widen it.

To perform this adjustment, you are recommended to use a dot-signal source (such as checked pattern) for each input. In this screen vertical line flickers will appear. Use the + or - button on the remote control so that line flickers are not seen. When line flickers are not seen, this indicates that horizontal display size is appropriate.

NOTE: This adjustment does not work in VIDEO mode.

IMAGE LOCK

Reduces video noise or jitter using the + or - button on the remote control. To activate this function, press the + button, and to deactivate it, press the - button.



NOTE: This adjustment should be performed after the PIXEL LOCK adjustment is completed.

NOTE: This adjustment does not work in VIDEO mode.

H. POSITION

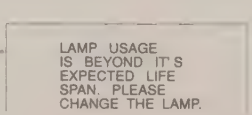
Adjusts the horizontal display position. Pressing the + button moves the image right, and pressing the - button moves the image left.

V. POSITION

Adjusts the vertical display position. Pressing the + button moves the image up, and pressing the - button moves the image down.

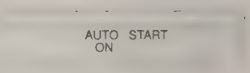
LAMP TIMER

Displays the amount of the operating time of the lamp. When the operating time of the lamp exceeds 750 hours of operating time, the warning message as shown on the right appears when the LCD projector is turned on. This message advises you to replace the lamp.



AUTO START

The AUTO START mode is a convenient way to start up the LCD projector without pressing the POWER ON button on the remote control. You can turn the LCD projector on and off by supplying AC power to the LCD projector.
To activate this function, press the + button in the AUTO START mode.



NOTE: When using this function, make sure that the mechanical main POWER switch on the front panel is pressed to the ON position.

SET POSITION

You can reverse the image horizontally or vertically in this mode when using a mirror or for ceiling installation.

To do this, follow the instructions below.
When the + button is pressed, the item is changed as follows:
FRONT FLOOR-REAR CEILING-REAR FLOOR- FRONT CEILING-
When the - button is pressed, the item is changed in the reverse order above.

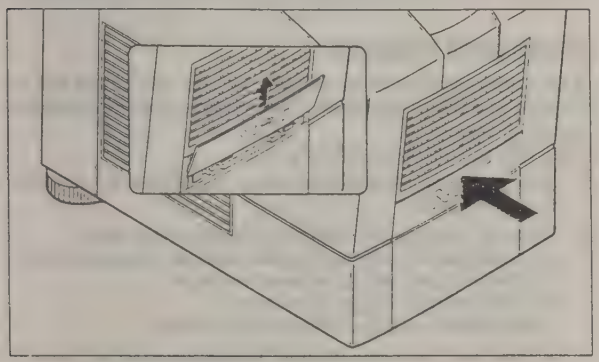
NOTE: The SET POSITION item is not reset.

Replacing the Lamp

When the amount of time the lamp has been used exceeds 750 hours, the WARNING indicator lights up and the on-screen message appears at the start-up. This advises the user to replace the lamp.

CAUTION : DO NOT touch the lamp, especially never the bulb in operating. Turn power off and allow about one hour for the lamp to cool down otherwise touching the lamp can cause a burn.

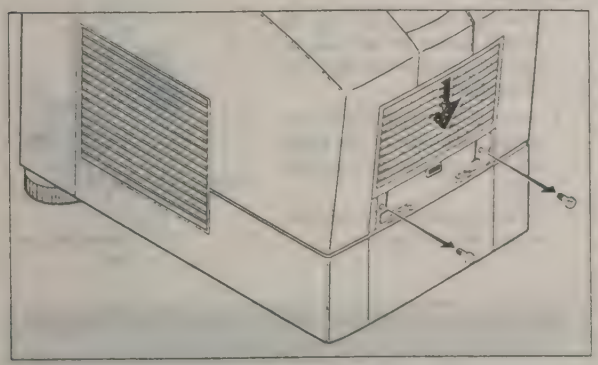
To replace the lamp with a new one, follow the instructions below:



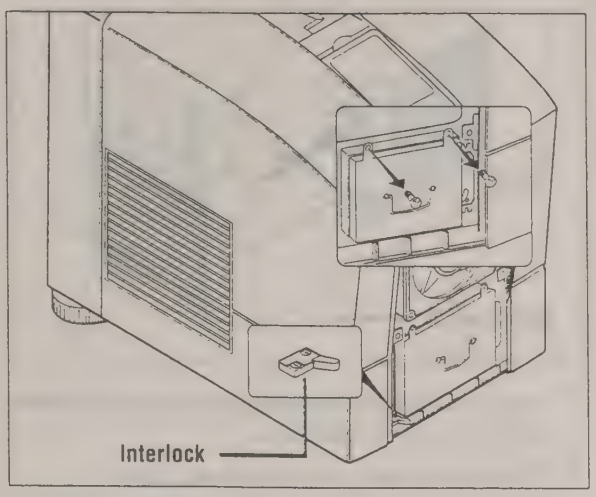
1 Be sure to unplug the power cable.

2 Remove the NEC plate on the rear of the LCD projector by pressing the top of the letter "E" hard.

ATTENTION : NE PAS toucher la lampe, surtout pas l'ampoule lorsqu'elle fonctionne. Couper l'alimentation et attendre environ une heure pour que la lampe refroidisse, car le fait de toucher la lampe peut provoquer une brûlure.

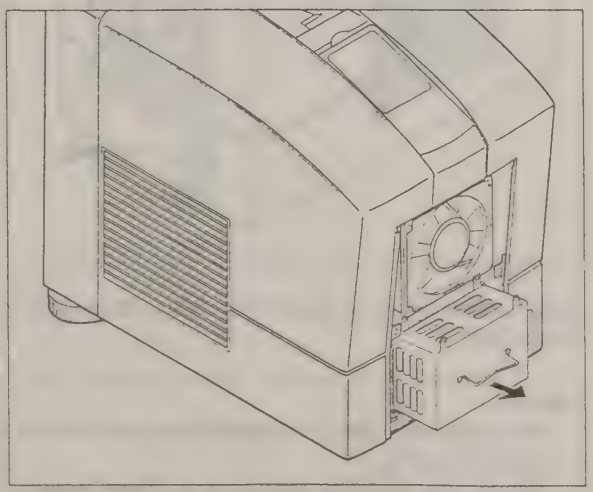


Remove the two screws and detach the lamp house cover.



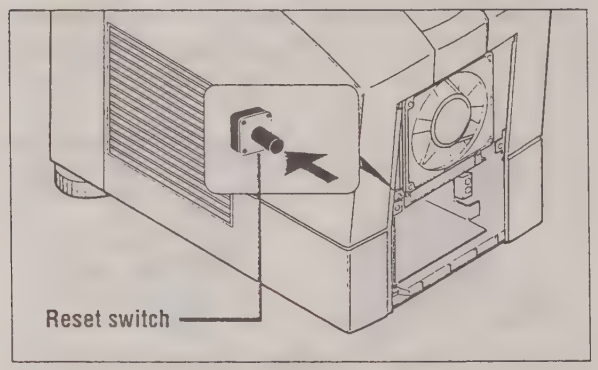
Remove the two screws out.

WARNING : This product is provided with an interlock to reduce the risk of electric shock. Do not defeat its purpose.



Pull the handle and take off the lamp.

ATTENTION : Ce produit est munt d'un verrou pour reduire le risque de choc electrique.
L'utiliser a bon escient.

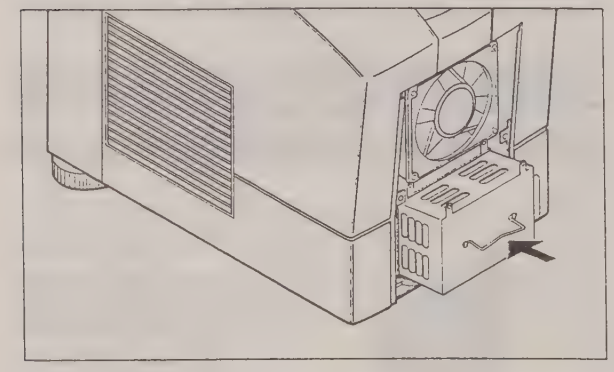


1 Plug in the power cable and put the mechanical power switch on the front panel to on.

2 Push the reset switch for two seconds or more.

The lamp timer is reset by pressing the reset switch. The operating time of the lamp on the screen is reset to zero hour.

3 Unplug the power cable.



Install a new lamp and accomplish reinstallation procedures in reverse order.

NOTE:
- We recommend users to replace the filter also when replacing the lamp.
- Contact your dealer for optional lamp. When ordering lamps, include model name MT LAMP.

CAUTION: When installing a new lamp, do not touch the bulb itself.
Failure to observe this could degrade the performance in brightness.

ATTENTION : Lors de la mise en place d'une nouvelle lampe, ne pas toucher á l'ampoule.
Si vous ne respectez pas cette consigne, la luminosité pourrait s'en trouver atténuée.

Overheated Protector

If the internal temperature rises too high, the lamp turns off and then the WARNING indicator starts flashing. After the lamp turns off, the cooling fans operate for two minutes.
Should this happen, take the following steps:

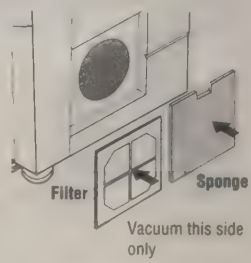
1. When the cooling fans stop in two minutes, unplug the power cable from the LCD projector.
2. Check the following items and take the necessary steps below.
   a) If using the LCD projector in a place where the ambient temperature is too high, reinstall it in an appropriate place.
   b) If the air filter is clogged, clean the filter.
   - If this does not solve the problem, call your dealer.
3. Allow at least five minutes for the LCD projector to cool.

Cleaning the Filter

The air-filter keeps the inside of the LCD projector free from dust or dirt. Dust or dirt on the air filter can cause heat build-up inside the LCD projector. Clean the air-filter as often as possible.
To clean the air-filter, follow the instructions below:

1. Unplug the power cable and wait until the fans stop.
2. Remove the filter panel. Then take out the filter and sponge.
   - Push down on the catch of the filter panel and detach it.
3. Use a vacuum cleaner to clean the filter and the sponge.

CAUTION:
- Clean the outside only with the vacuum cleaner. Do not clean the opposite side (side with the CAUTION label on).
- Do not clean the air-filter and the sponge with water or any liquid. This can cause damage to the filter mesh.
- Do not operate the LCD projector without the air-filter.



NOTE: Be sure to fit the air-filter in the LCD projector. The LCD projector will not turn on unless the air-filter is attached correctly.

4. Reinstall the air-filter and filter panel.

Warning Indicator (LED) Message List

	Status / Comments
OFF	Normal
ON (steady red)	The lamp is beyond its expected life span. Replace the lamp.
Blinking red	Check the filter and the sponge and clean them if required. Check the filter panel and install it properly if required. You should allow a minimum of one minute to elapse between uses of the POWER ON button on the remote control. Otherwise the lamp may not turn on.

APPENDIX

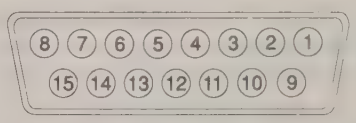
D-sub Pin Assignment

15-pin mini D-sub for IBM Computers

Pin No.	Input Signal
1	Red
2	Green
3	Blue
4	GND
5	No Connection
6	Red GND
7	Green GND
8	Blue GND
9	No Connection
10	Digital GND
11	GND
12	No Connection
13	Horizontal Sync
14	Vertical Sync
15	No Connection

15-pin D-sub for MAC II or LC Computers

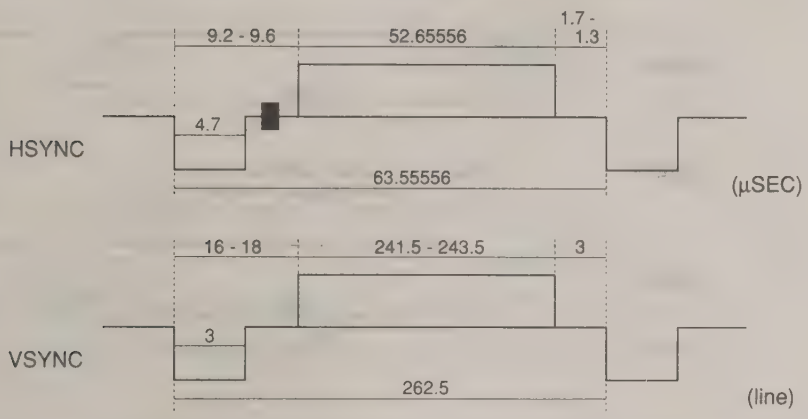
Pin No.	Input Signal
1	Red GND
2	Red
3	Hrizontal Sync
4	GND
5	Green
6	Green GND
7	No Connection
8	No Connection
9	Blue
10	No Connection
11	GND
12	Vertical Sync
13	Blue GND
14	No Connection
15	No Connection



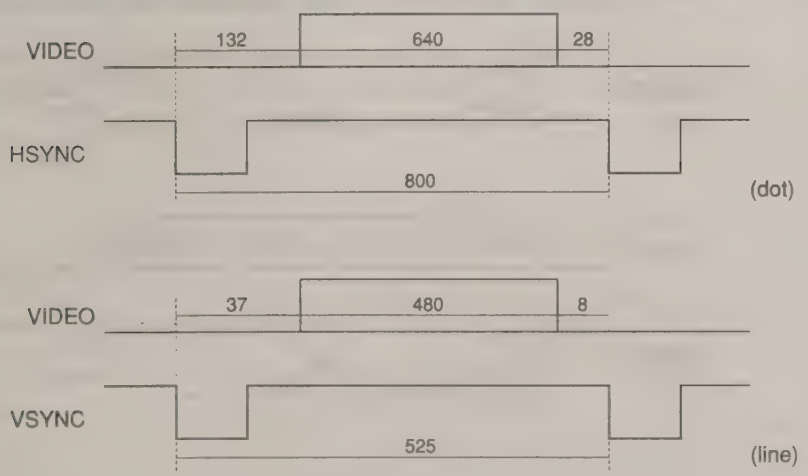
NOTE : These connectors are located in the RGB INPUT on the front terminal panel.

Timing Chart

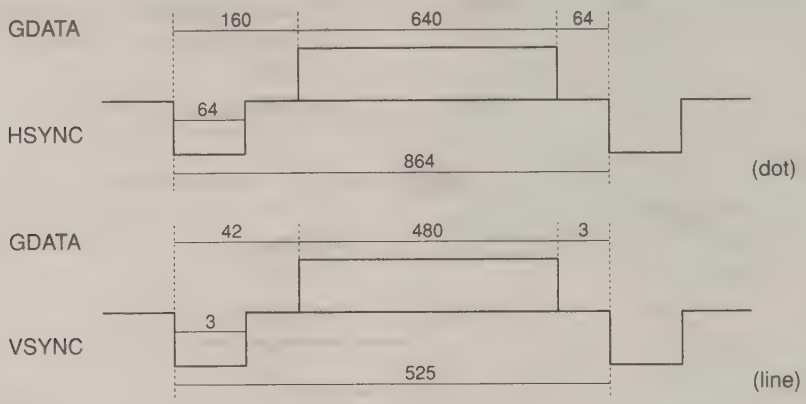
NTSC (525line) Horizontal Frequency 15.734264 kHz
Vertical Frequency 59.94 Hz



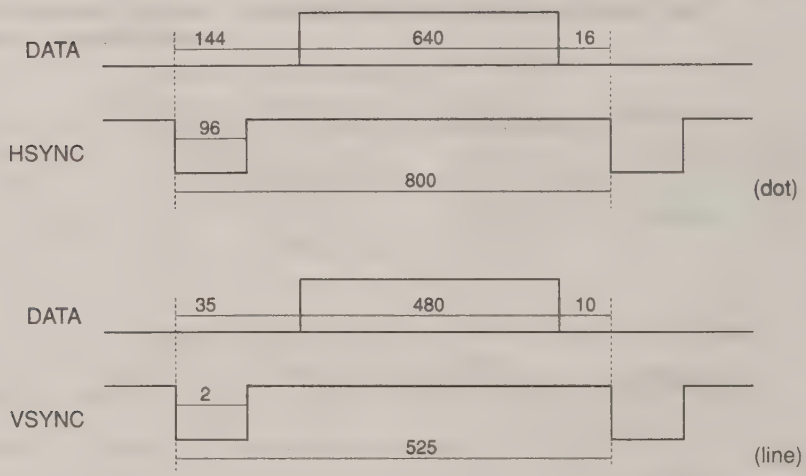
Scan Converter (640 × 480) CLK 25.1748224 MHz Horizontal Frequency 31.4685 kHz
Vertical Frequency 59.94 Hz



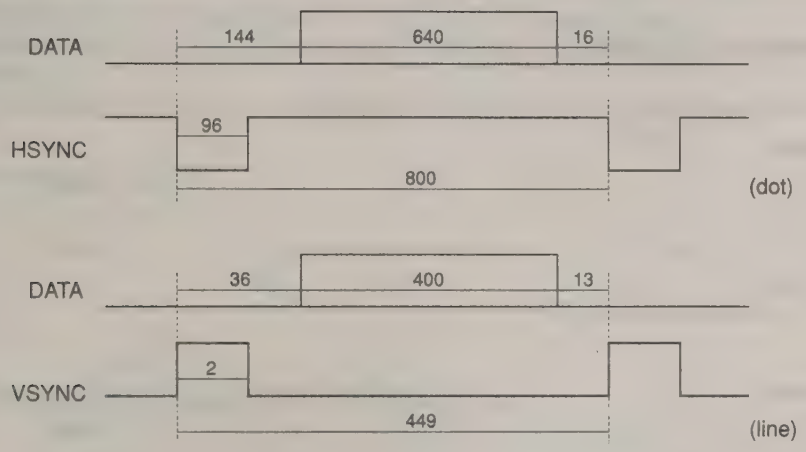
Mac II (640 × 480) CLK 30.24 MHz Horizontal Frequency 35.0 kHz
Vertical Frequency 66.67 Hz



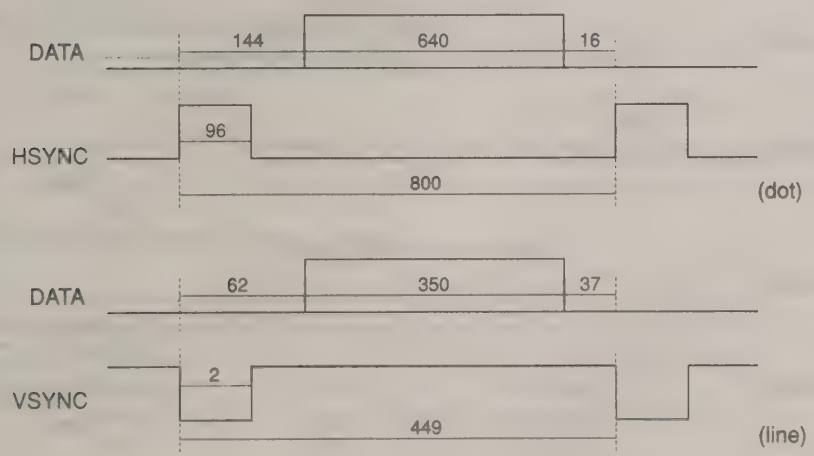
VGA GR1 (640 × 480) CLK 25.175 MHz Horizontal Frequency 31.4688 kHz
Vertical Frequency 59.9405 Hz



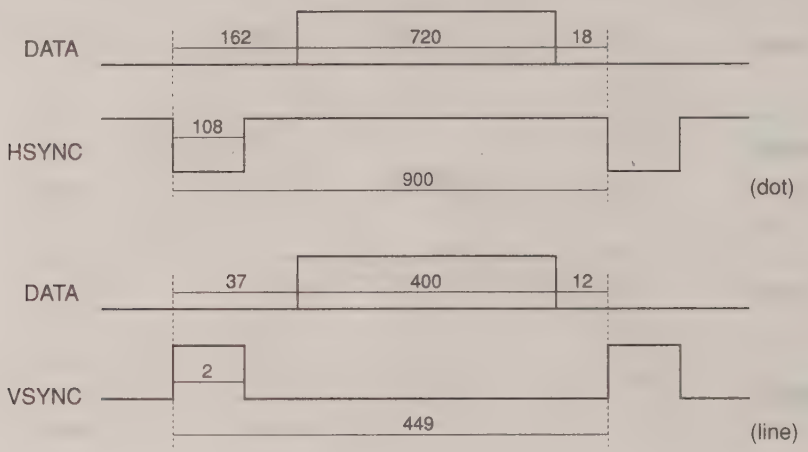
VGA GR2 (640 × 400) CLK 25.175 MHz Horizontal Frequency 31.4688 kHz
Vertical Frequency 70.0863 Hz



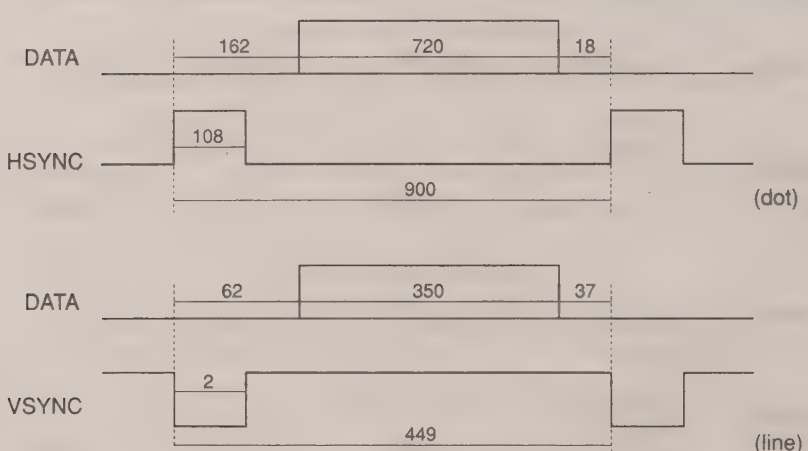
VGA GR3 (640 × 350) CLK 25.175 MHz Horizontal Frequency 31.4688 kHz
Vertical Frequency 70.0863 Hz



VGA TX1 (720 × 400) CLK 28.322 MHz Horizontal Frequency 31.4689 kHz
Vertical Frequency 70.0866 Hz



VGA TX2 (720 × 350) CLK 28.322 MHz Horizontal Frequency 31.4689 kHz
Vertical Frequency 70.0866 Hz



Power Supply

Power Supply failures can cause any number of problems, such as no displayed picture, no power supplied to each of the PWBs, the lamp is not lit or the panel's not operating properly. These problems could be due to a power supply failure, or an overcurrent protector located in the supply, possibly caused by a short circuit in one of the PWBs. Any of these conditions will lead to generation of incorrect output voltage levels.

When a projector problem occurs, it is important to first datermind whether the power supply or some other PWB is the actual failure.

Therefore, the following sequence is recommended to simplify your troubleshooting efforts.

Has the PS PWB fuse opened?

YES

NO

NO: Replace the fuse.

Is there a voltage output of about 5V DC at the PO connector?

YES

NO

NO: IC653 or its peripheral circuit failure.

Are both PO Pins 1 and 2 at a high level (3.5V or above)?

YES

NO

NO: Failure in peripheral circuit of the main CPU.

Protector in operation, or failure in primary circuit

Are the following voltages generated at the respective connectors on the PS PWB?

Connector	Pin No.	Voltage
PM	①	About +20V
PM	②	About +18V
PM	③	About +18V
PM	④	About +6.5V
PM	⑤	About –8.5V
PM	⑥	About –10V
PM	⑧	About +6.5V
PV	①	About +12V
PV	②	About + 5V
NA	①	About +12.5V
NB	①	About +12.5V

NC ① Approx. +10V

NO — YES

Disconnect the PV connector from PS PWB and check voltages at Pins ① and ② of the PV connector. Is each voltage normal?

The power block is normal.

NO — YES

To safely stop the high voltage, disconnect BZ and NA from the PS PWB check the voltages at NA pin 1. Is the voltage normal?

VIDEO PWB failure.

NO — YES

Disconnect the NB connector from PS PWB and check the voltage at Pin ① of the NB connector. Is the voltage normal?

FAN A failure.

NO — YES

Disconnect the NC connector from PS PWB and check the voltage at Pin ① of the NC connector. Is the voltage normal?

FAN B failure.

NO — YES

Check voltages at Pins ② and ⑥ of the PM connector. Are the voltages normal?

FAN C failure.

YES — NO

Check the voltage at Pin ① of the PM connector. Is the voltage normal?

- TERM PWB failure.
- Or either panel failure.

YES — NO

Draw out the PM connector and connect a dummy load. Check voltages at Pins ③ to ⑤ and ⑧ of the PM connector. Are the voltages normal?

- Peripheral circuits of IC1301 to 1312 are ofailure.
- TERM PWB failure.
- The panel failure.

YES — NO

MAIN PWB is failure.

PS PWB failure.

MAIN Block

* No power.

Are lamps lit?

NO → Mount a remote controller on the main body and turn on the POWER Key of this controller. Is the POWER LED turned green at that time?

NO → Is the POWER LED turned on in orange color and does the WARNING LED flash?

NO → Is the filter correctly inserted?

YES → Inadequate insertion of the filter.

NO → Inadequate mounting of the lamp cover.

YES → When the remote controller is operated, is there an input of the waveform shown below at Pin (2) of the SW connector in MAIN PWB?

NO → The CPU or its peripheral circuits are out of order.

YES → Remote controller or the connector terminal block is out of order.

NO → Does the fan stop soon?

YES → Is it correctly set in the lamp socket?

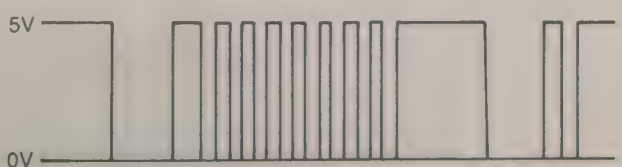
YES → The lamp has failed.

YES → Lamp case connections are defective.

NO → Protector is in operation at a high temperature inside the set, or its peripheral circuit is out of order.

NO → The power circuit is turned on (normal operation).

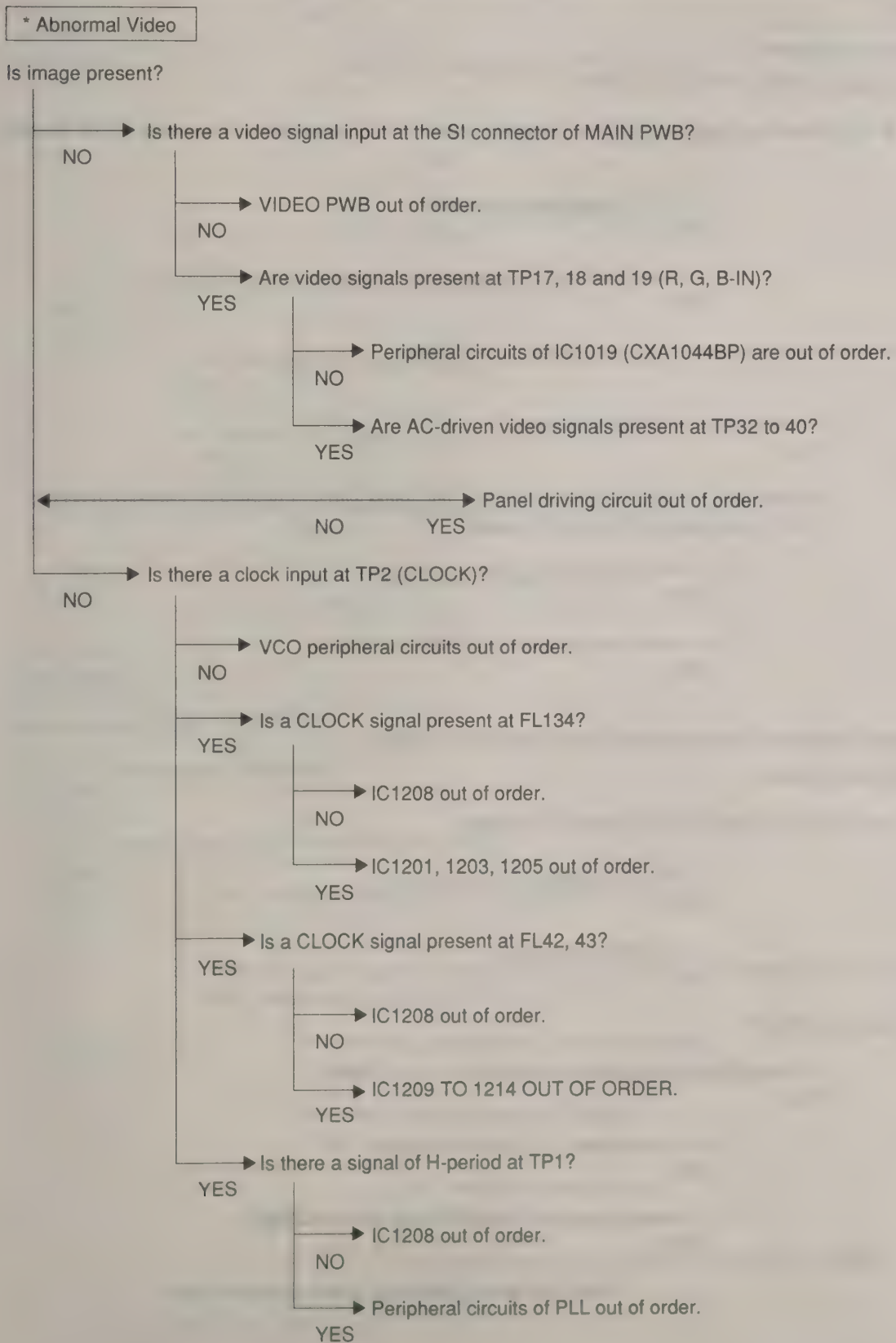
YES



* Image is not present due to horizontal sync problem.

Is the set switched over to the input signal mode (e.g. RGB1)?

- NO → Use a remote controller and make switching over to the input signal mode.
- YES → Is a signal output available at the HV connector?
  - NO → VIDEO PWB out of order.
  - YES → Are negative-polarity pulses output at TP41 (HD)?
    - NO → IC1011 (M52001) out of order.
    - YES → IC1208 out of order.


* Abnormal Video
Is image present?
Is there a video signal input at the SI connector of MAIN PWB?
NO
VIDEO PWB out of order.
NO
Are video signals present at TP17, 18 and 19 (R, G, B-IN)?
YES
Peripheral circuits of IC1019 (CXA1044BP) are out of order.
NO
Are AC-driven video signals present at TP32 to 40?
YES
Panel driving circuit out of order.
NO
YES
Is there a clock input at TP2 (CLOCK)?
NO
VCO peripheral circuits out of order.
NO
Is a CLOCK signal present at FL134?
YES
IC1208 out of order.
NO
IC1201, 1203, 1205 out of order.
YES
Is a CLOCK signal present at FL42, 43?
YES
IC1208 out of order.
NO
IC1209 TO 1214 OUT OF ORDER.
YES
Is there a signal of H-period at TP1?
YES
IC1208 out of order.
NO
Peripheral circuits of PLL out of order.
YES

VIDEO Block

* Video color is not present.

Is a chromatic signal entered in Pin 22 of IC7006?

- NO → Is an input signal at Pin 2 of IC7001 at a high level in NTSC mode and at a low level in PAL mode?
  - NO → Y/C separator out of order.
  - YES → IC7005 and its peripheral circuit are out of order.
  - NO
- YES → Is there several volts of DC input at Pin 23 of IC7006?
  - NO → IC7010 or CPU out of order.
  - YES → Does Pin 28 of IC7006 generate a sine wave with a frequency of 3.58MHz in NTSC mode and 4.43MHz in PAL mode?
    - YES → IC7006 or ACC filter out of order.
    - NO → Crystal oscillator or IC7005 out of order.

* No sync. signal appears at Terminals H and V in VIDEO SELECT mode.

Is Pin 11 of IC7010 at L level?

- NO → IC7010 or its peripheral circuits are out of order.
- YES → Y/C separator is out of order.
  - YES → IC7005 defective.
  - NO
- NO → Is it H-SYNC?
  - YES → Is there a clock signal of 32fn at Pin 11 of IC7006?
    - NO → Oscillator or IC7006 out of order.
    - YES → Is a signal of 15kHz period at Pin 6 of IC7006?
      - YES → IC7006 and its peripheral circuits are out of order.

NO

Is there a signal input at Pin 2 of IC7009?

YES

IC7007 or IC7008 out of order.

NO

IC7009 out of order.

YES

Is there a signal input at Pin 12 of IC7006?

NO

IC7006 or its peripheral circuits are out of order.

NO

Is there a signal output at Pin 13 of IC7006?

YES

IC7006 or its peripheral circuits are out of order.

NO

IC7009 out of order.

YES

* No audio

Is there an audio signal at CP6 pin 1.

Speaker out of order.

YES

Is a signal at Pin 3 of IC7021 at L level?

NO

CPU peripheral or IC7021 out of order.

NO

Choose VOLUME in the MENU key and move it to an adjusting value of 32. Is the voltage around 5.0V at Pin 12 of IC7010?

YES

CPU peripheral or IC7010 out of order.

NO

Is a signal entered in IC7021?

YES

IC7021 out of order.

YES

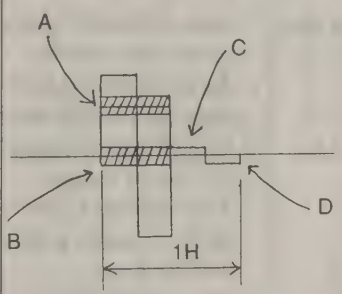
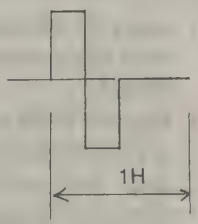
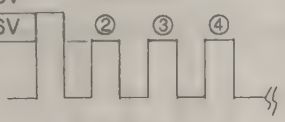
Circuits from IC7020 to Q7044 are out of order.

NO

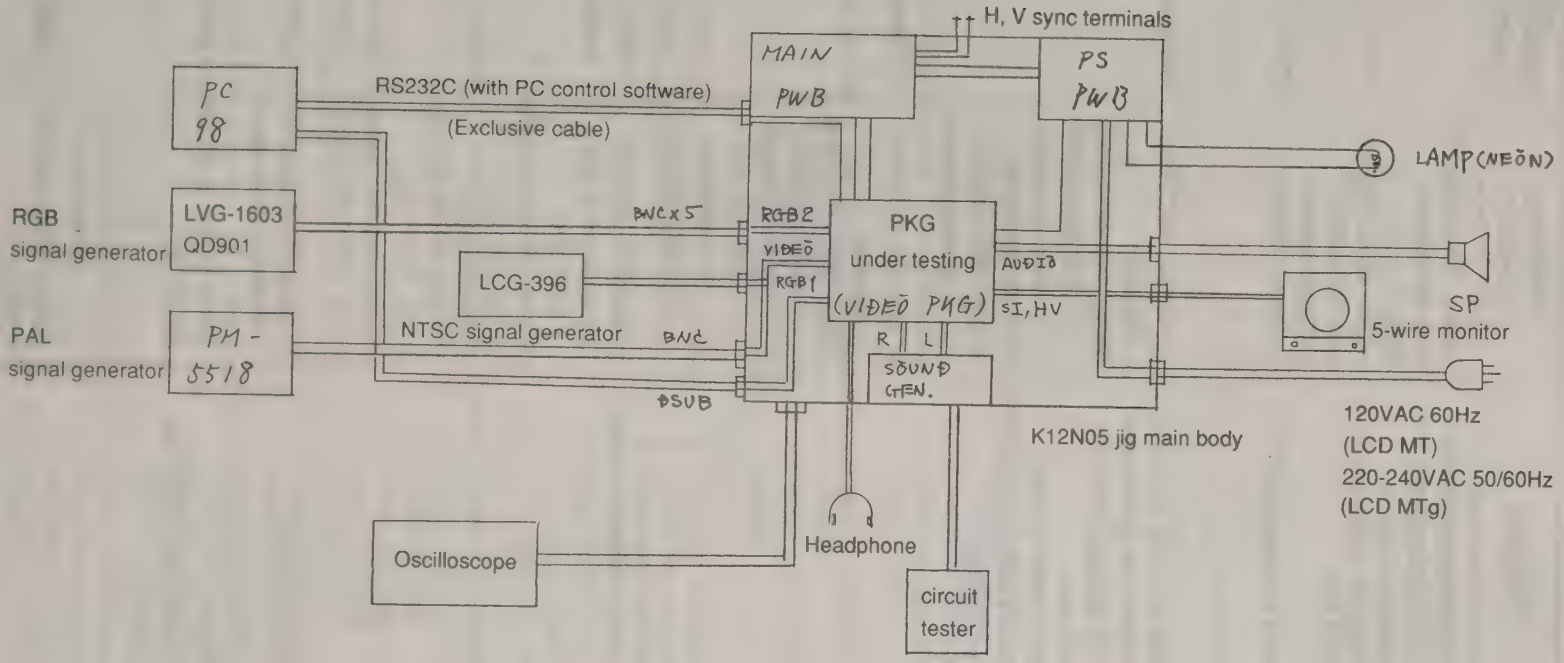
ADJUSTMENT PROCEADURE

(1) VIDEO PWB

No.	Test item	Standard	Measuring conditions	Measuring point	Adjustments
1.	Adjustments for Video Block				
1-1	White-balance contrast adjustments (Video signal input adjustments) (NTSC adjustments)	1. Use an oscilloscope and adjust the amplitude to 0.7 ±0.05Vp-p (Note) Accuracy shall be secured. (Note) This adjustment shall be effected accurately.	• The control switch shall be set on "PC" side. 1. All-white signal shall be entered from LCG-396 to CN1. (N/P SW depressed to the P side.) 2. VIDEO/RGB changeover shall be attempted from PC98 to the VIDEO side.	• TP3 (G) (Monitor)	• VR3
		2. Use the oscilloscope and adjust deviation within ±0.05V for the TP3 level. (Note) This adjustment shall be effected accurately.	1. The same conditions as above.	TP2 (R) TP4 (B)	VR5 VR6
2.	Adjustments for Color Demodulator Block				
2-1	1H delay line adjustments (PAL adjustments)	1. Use an osilloscope and make the figure of Fig. 1A appear to be a straight line (Fig. 2). 2. Use the oscilloscope and make the figure of Fig. 1B appear to be a straight line (Fig. 2). 3. Use the oscilloscope and make the amplitudes of Fig. 1C and D aligned (Fig. 2).	1. Using PAL signal generator FM-5518, enter the "DEM" signal in CN1. (N/P SW deprssed to the P side.) 2. Using PC98, make VIDEO/PGB changeover to the VIDEO side. 3. Using PC98, set the color data to the maximum value (3FH).	• 1H (Jig panel) (Monitor)	(1) T1 (2) VR4 (3) L3

No.	Test item	Standard	Measuring conditions	Measuring point	Adjustments
		 Fig. 1  Fig. 2			
3. 3-1	Sub-color adjustments	1. Approx. 0.8V Approx. 0.6V  Fig. 3 (10μ/div, 0.2V/div) Make adjustments so that the output waveform can appear as illustrated above. (Amplitudes of ② to ④ are almost equal to each other.)	1. Using PM-5518, enter a full-color bar of PAL into CN1. 2.. Using PC-98, set the color data to the center value (20H). (N/P SW depressed to the P side.)	• TP4	• VR7
3-2	Sub-tint adjustments	2. Approx.0.6V Fig. 4 (10μ/div, 0.2V/div) Adjust the output waveform as illustrated above. (Amplitudes shall be almost equal to each other.)	1. Using LCG-396, enter a full-color bar of NTSC into CN1. 2. Using PC-98, set the TINT data to the center value (20H). (N/P SW depressed to the N side)	•TP4	•VR2

No.	Test item	Standard	Measuring conditions	Measuring point	Adjustments
4.	Checks on Audio Block				
4-1	Speaker jack checks	Sound shall be generated from both "L" and "R." • The sound volume shall be increased.	1. Move the AUDIO switch to the ON position. 2. Set the AUDIO SELECT switch to the RGB side. 3. Using PC-98, increase the sound volume. 4. Then set the AUDIO SELECT switch to the VIDEO side.	•SP	
4-2	Headphone jack checks	The same as for 4-1.	The same as for 4-1.	• Earphone	
5.	Checks on input signals	• Normal pictures should be present.	1. Using PC-98, make input changeover to "RGB1." 2. Move the RGB1 switch to the OFF position. 3. Move SW1 (VIDEO PWB) to the ON position.	• Screen	
		• Normal pictures should be present.	1. Move the RGB1 switch to the ON position. 2. Move SW1 (VIDEO PWB) to the OFF position.	• Screen	

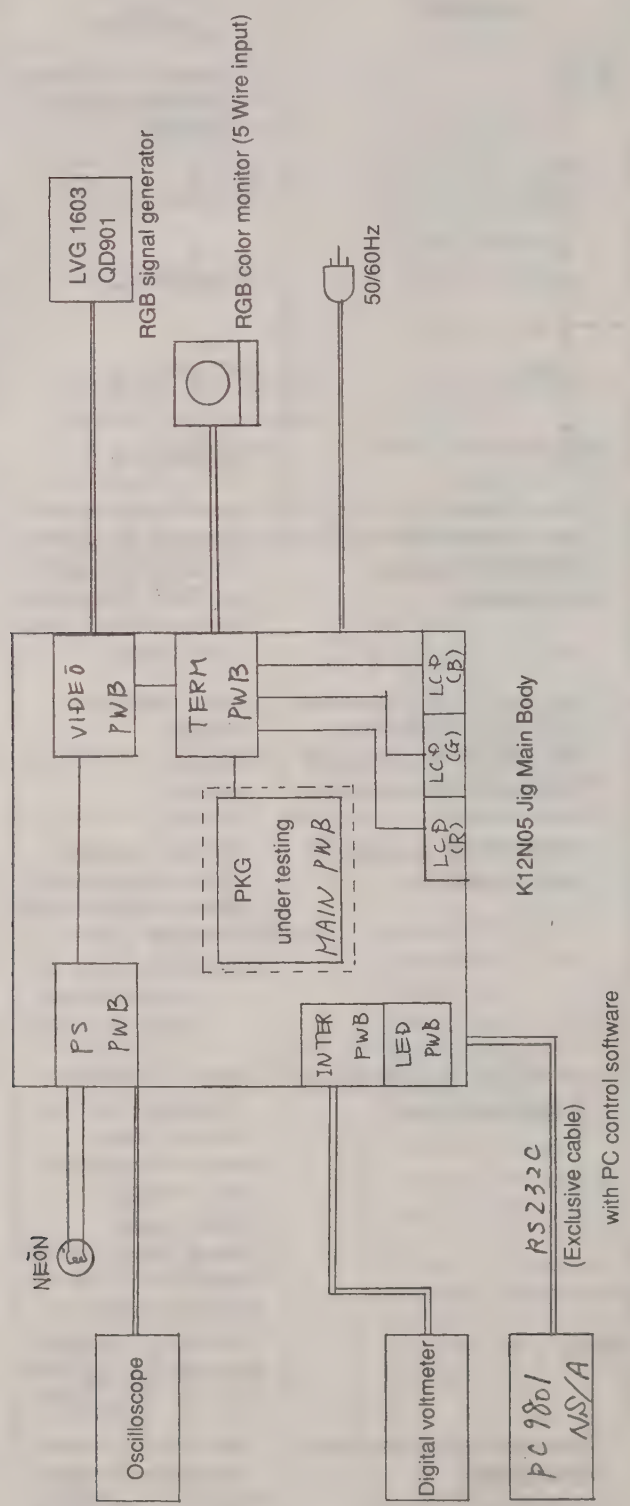


Test Equipment Connectios.

(2) MAIN PWB

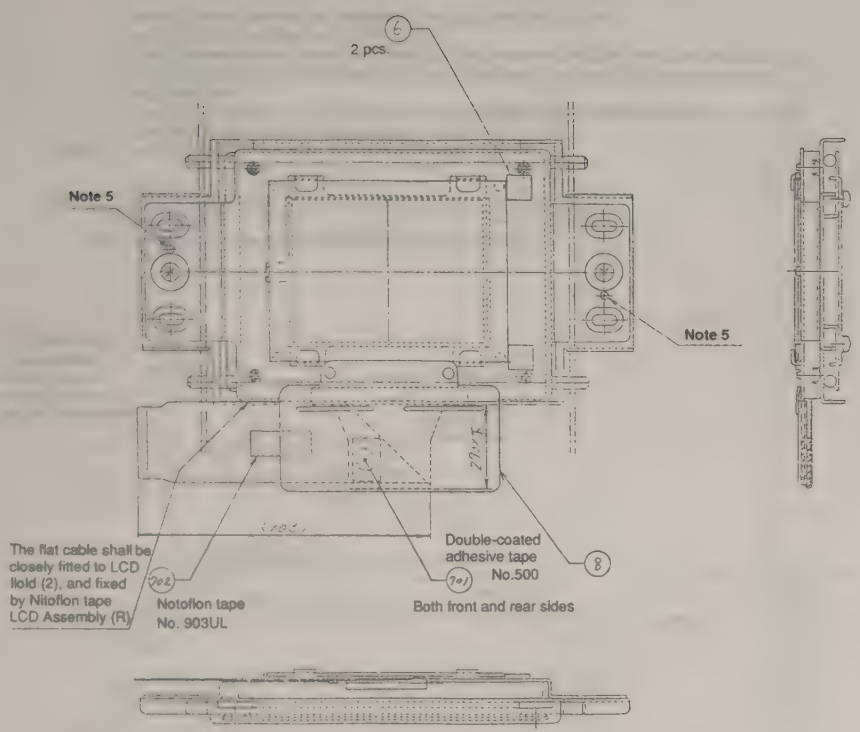
No.	Test item	Standard	Measuring conditions	Measuring point	Adjustments
1.	PLL Oscillation Frequency Adjustments	The following adjustments shall be conducted after the completion of heat-run.	Feed a VGA signal from LVG 1603/QD901 (Prog. No. 3).		
1-1	Voltage adjustments	1. Adjust the voltage to 3.0V ±0.1V DC.	[• Input signal: RGB2] [• AUTO MODE] 1. Digital voltmeter	• TP10	• L1
1-2	Frequency adjustments	2. Adjust the voltage to $3.0^{+0.1}_{-0}$ V	2. Digital voltmeter	• TP11	•VR1
2.	Operational Checks				
2-1	Thermistor block	1. After the lapse of about 2 minutes, the video output shall disappear from the LCD panel. • The "LAMP" is unlit. • The "WARNING LAMP" (red) fiashes.	1. Turn the "RT" knob clockwise (Note) After confirming that the "LAMP" is unlit, immediately turn the ="RT" knob fully counterclockwise.	• RT terminal	• "RT" knob <Reference voltage> Lit around 4.51V or below.
			2. Turn the "LT" knob clockwise. (Note) After confirming that the "LAMP" is unlit, immediately turn the "LT" knob fully counterclockwise.	• LT terminal	• "LT" knob <Reference voltage> Lit around 4.53V or below.
2-2	Data transfer	1. The DC voltage changes.	• Make VIDEO/RGB changeover to the VIDEO side. • Using VP-8400A, enter a full color bar. (NTSC mode) 1. Using PC-98, change the "TINT" data. 2. Using PC-98, change the "COLOR" data.	• "TINT" terminal • "COLOR" terminal	
		2. It should light.	2. Using PC-98, assume POWER ON condition.	• LAMP	
2-3	Lamp lit/unlit	1. "Unlit" "WARNING LAMP" (red) flashing ↓ "Lit"	Turn "LM" SW to be ON (SHORT) ↓ Turn "LM" SW to be OFF (OPEN).	• LAMP • LAMP	

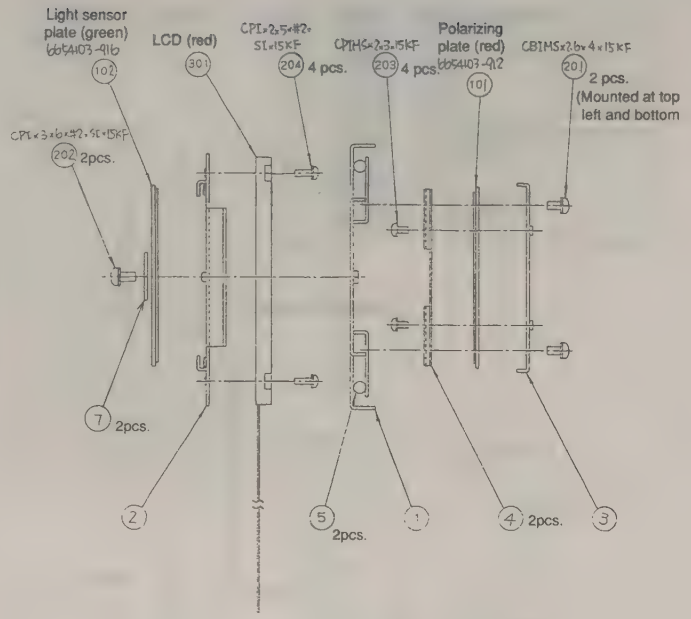
No.	Test item	Standard	Measuring conditions	Measuring point	Adjustments
		2. "Lit" ↓ "Unlit" ↓ "Lit" ↓ "Unlit" ↓ "Lit"	2. Set both "FC" SW and "LC" SW to be ON (SHORT). ↓ "FC" SW → ↓ "FC" SW → ↓ "LC" SW → ↓ "LC" SW →	• LAMP OFF (OPEN) ON (SHORT) OFF (OPEN) ON (SHORT)	
2-4	PC control	1. The screen display for SET POSITION changes. (in 4 modes).	1. Using PC-98, change the SET POSITION. 2. Let "RGB1" be available. 3. SW3 of VIDEO PWB →"PC" side	• Monitor	
	H POSITION checks	2. The picture move from the right end to the left end. (The bar turns blue at the left end and red at the right end.)	1. Make setting for "RGB2" 2. Operation in "H POS" setting.	• Monitor	
2-5	Remote controller operation checks	1. "VIDEO/RGB" changeover shall be possible.	1. Remote controller (Both front and rear) 2. SW3 of VIDEO PWB → "REM" side (Note) At that time, pull out the RS232C cable from PWB.		
2-6	Video, sync. signals	1. No abnormality shall appear in the video output.	1. Make "VIDEO/RGB" changeover to the "VIDEO" side. • Enter a full-color bar from VP-8400A (NTSC mode). 2. Make "RGB2" setting. • Set VG-814 under the following conditions: Prog No. 01 → 24kHz Prog No. 03 → 31kHz Prog No. 08 → 35kHz	• Monitor	
		2. Pictures shall be free from latch errors.	1. Set "VG-814" under the following conditions: Prog No. 3 → 31kHz Prog No. 8 → 35kHZ	• Monitor	



Test Equipment Connectios.

DISASSEMBLY

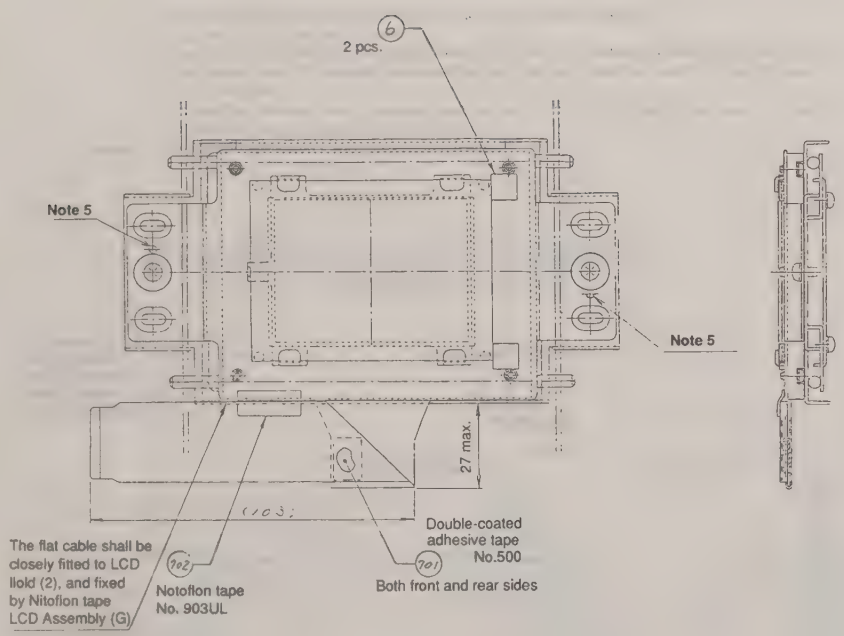


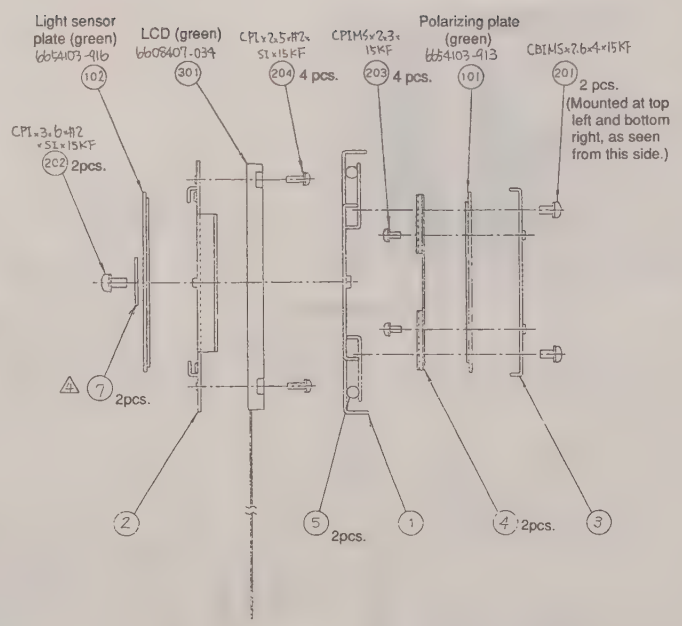


Disassembly Diagram

REQUD	PART NO.	DESCRIPTION	REMARKS
1	6071558000	LCD BASE	
1	6072934000	LCD RETAINER	
1	6071579000	POL FILTER BRACKET	
2	6072913000	POL CLIP	
2	6532814000	BAR	
2	6544539000	CLAMPING RUBBER	
2	6073340000	SPECIAL SCREW	
1	6544598000	INTERCEPT PLATE	
1	6654103912	POLARIZING PLATE ASSY (G)	
1	6654103915	ANALYZING PLATE ASSY (G)	
2	6656150706	SCREW	
2	6656150369	SCREW	
4	6656202005	SCREW	
4	6656150372	SCREW	
1	6608407034	LCD UNIT	
REF	6665800029	DOUBLE ADHESIVE TAPE	
REF	6665800041	TAPE	
REF	EPB-0355	ADJUSTMENT ASSY	
REF	EOP-F-2376	K12N05 UNIT WORKING BOND	

Notes:
1. Assembly adjustments shall conform to EPB-0355.
2. Working procedures shall conform to EOP-F-2376.
3. During this assembly work, measures shall be taken against static sharges, specified for EPB-0153, MOS-type parts.
4. This product must be absolutely free from dust and pollutants. Dust-proof measures shall be taken.
5. Prior to screw tightening for Item (202), insert the jigs (picture element fitting pins: P/N6534001) IN TWO ROUND HOLES SHOWN BY "Note 5."
6. Screw tightening torque in two positions for Item (202) shall be 8.5kgf.cm.

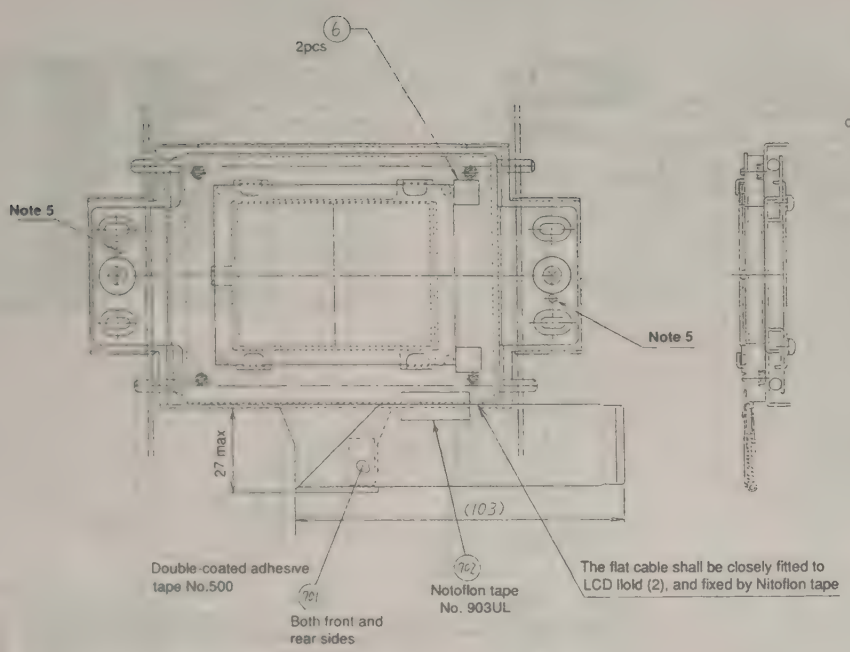




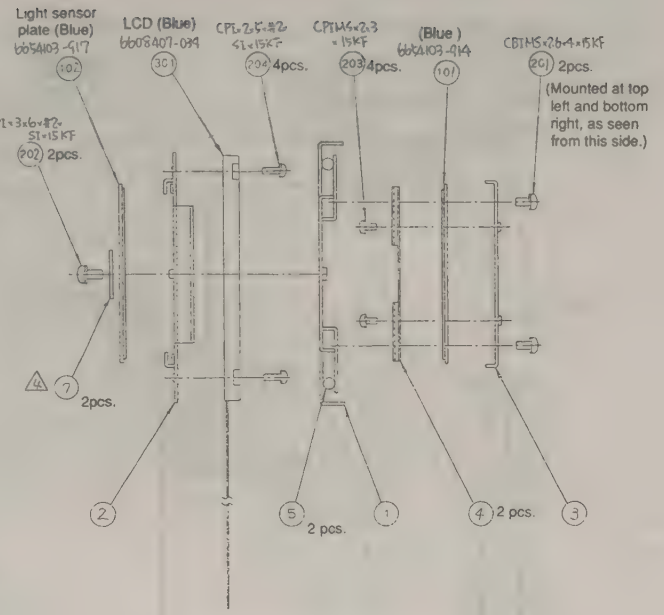
Disassembly Diagram

REQUD	PART NO	DESCRIPTION	REMARKS
1	6071558000	LCD BASE	
1	6072934000	LCD RETAINER	
1	6071579000	POL FILTER BRACKET	
2	6072913000	POL CLIP	
2	6532814000	BAR	
2	6544539000	CLAMPING RUBBER	
2	6073340000	SPECIAL SCREW	
1	6654103913	POLARIZING PLATE ASSY (G)	
1	6654103916	ANALYZING PLATE ASSY (G)	
2	6656150706	SCREW	
2	6656150369	SCREW	
4	6656202005	SCREW	
4	6656150372	SCREW	
1	6608407034	LCD UNIT	
REF	6665800029	DOUBLE ADHESIVE TAPE	
REF	6665800041	TAPE	
REF	EPB-0355	ADJUSTMENT ASSY	
REF	EOP F-2376	K12M05 UNIT WORKING BOND	

Notes:
1. Assembly adjustments shall conform to EPB-0355.
2. Working procedures shall conform to EOP-F-2376.
3. During this assembly work, measures shall be taken against static sharges, specified for EPB-0153, MOS-type parts.
4. This product must be absolutely free from dust and pollutants. Dust-proof measures shall be taken.
5. Prior to screw tightening for Item (202), insert the jigs (picture element fitting pins: P/N6534001) IN TWO ROUND HOLES SHOWN BY "Note 5."
6. Screw tightening torque in two positions for Item (202) shall be 8.5kgf.cm.



LCD Assembly (B)



Disassembly Diagram

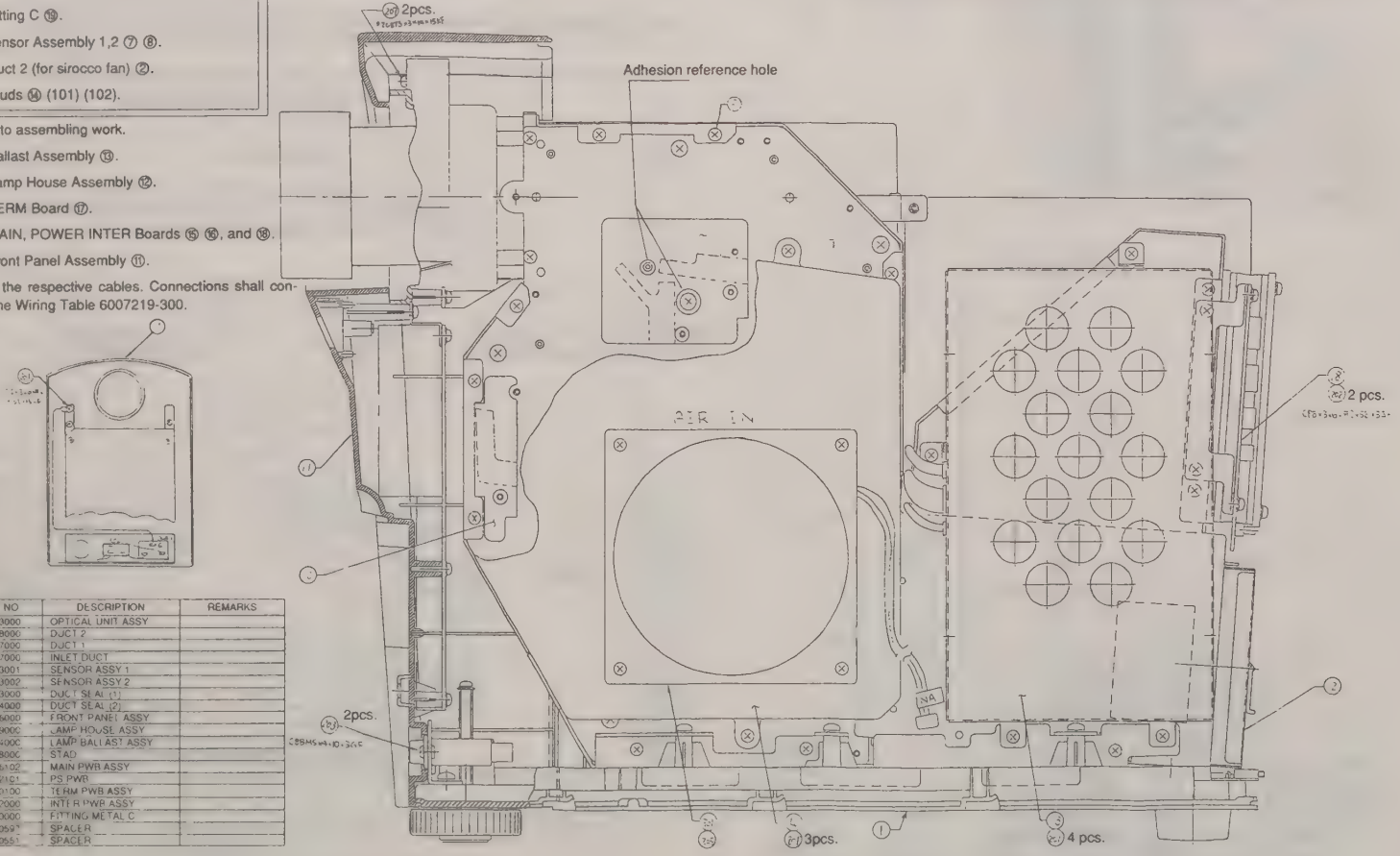
REQUD	PART NO	DESCRIPTION	REMARKS
1	6071558000	LCD BASE	
1	6072934000	LCD RETAINER	
1	6071579000	POL FILTER BRACKET	
2	6072913000	POL CLIP	
2	6532814000	BAR	
2	6544539000	CLAMPING RUBBER	
2	6073340000	SPECIAL SCREW	
1	6654103912	POLARZING PLATE ASSY (B)	
1	6654103915	ANALYZING PLATE ASSY (B)	
2	6656150706	SCREW	
2	6656150369	SCREW	
4	6656202005	SCREW	
4	6656150372	SCREW	
1	6608407034	LCD UNIT	
REF	6665800029	DOUBLE ADHESIVE TAPE	
REF	6665800041	TAPE	
REF	EPB-0355	ADJUSTMENT ASSY	
REF	EOP F 2376	K12N05 UNIT WORKING BOND	

Notes:
1. Assembly adjustments shall conform to EPB-0355.
2. Working procedures shall conform to EOP-F-2376.
3. During this assembly work, measures shall be taken against static sharges, specified for EPB-0153, MOS-type parts.
4. This product must be absolutely free from dust and pollutants. Dust-proof measures shall be taken.
5. Prior to screw tightening for Item (202), insert the jigs (picture element fitting pins: P/N6534001) IN TWO ROUND HOLES SHOWN BY "Note 5."
6. Screw tightening torque in two positions for Item (202) shall be 8.5kgf.cm.

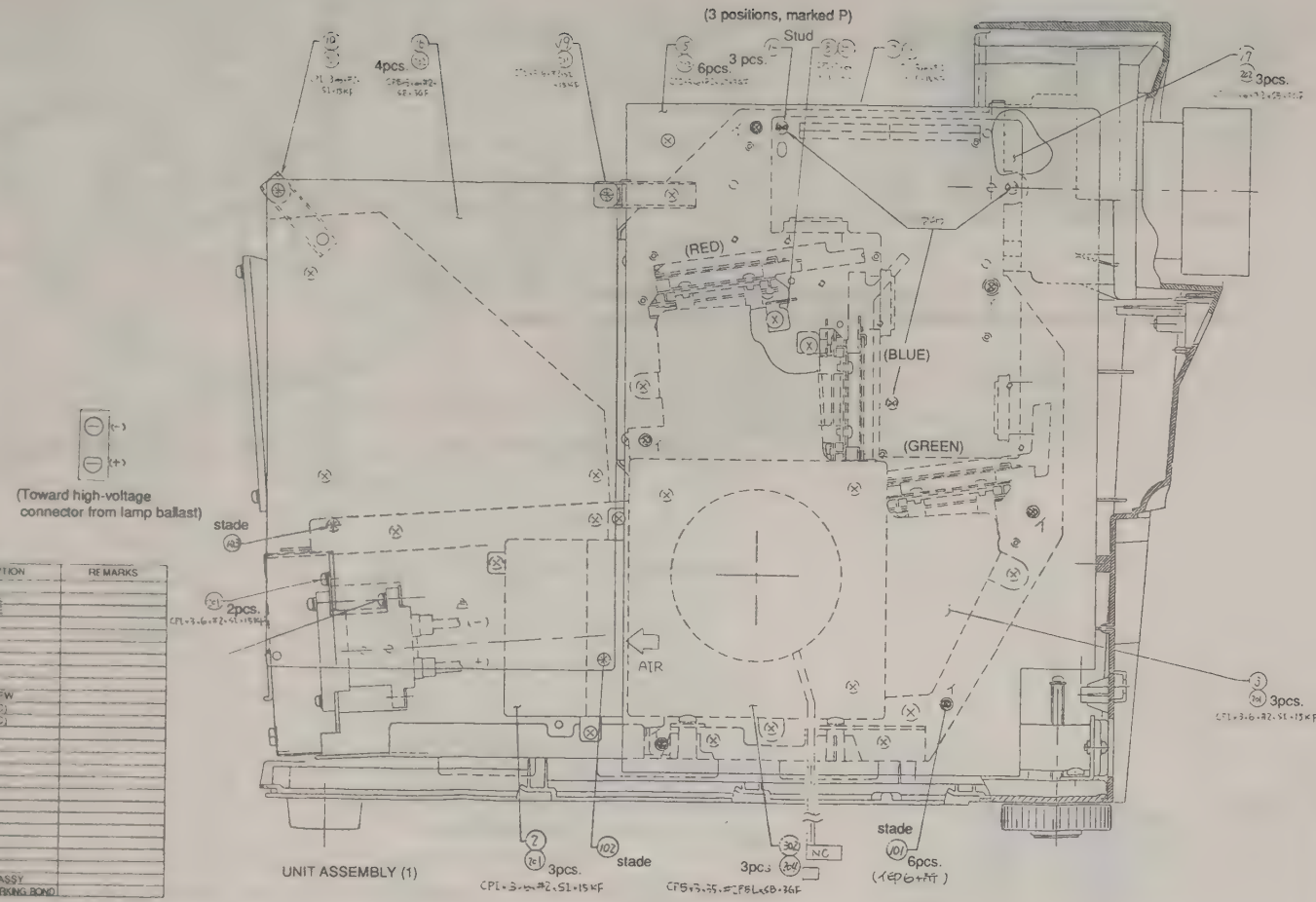
Fig. 1 Assembly Flowchart

① Stick Duct Seals 1,2 ⑨ ⑩ to Optical Unit ①.
② Mount Fitting C ⑲.
③ Mount sensor Assembly 1,2 ⑦ ⑧.
④ Mount Duct 2 (for sirocco fan) ②.
⑤ Mount Studs ⑭ (101) (102).
⑥ Mount Duct 1 (for sirocco fan) ③ and Fan (302).
⑦ Mount Suction Duct ④ and Fan (301).
⑧ Proceed to assembling work.
⑨ Mount Ballast Assembly ⑬.
⑩ Mount Lamp House Assembly ⑫.
⑪ Mount TERM Board ⑰.
⑫ Mount MAIN, POWER INTER Boards ⑮ ⑯, and ⑱.
⑬ Mount Front Panel Assembly ⑪.
⑭ Connect the respective cables. Connections shall conform to the Wiring Table 6007219-300.

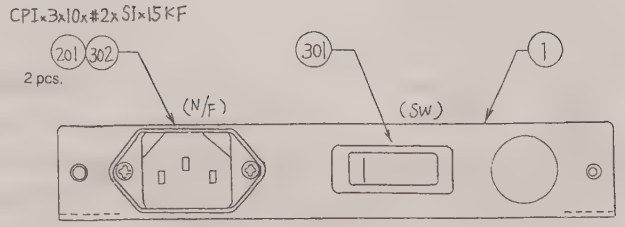
Notes:
1. Assembly adjustments shall conform to EPB-0355.
2. Working procedures shall conform to EOP-F-2376.
3. Fig. 1 shows the assembly flowchart.
4. Wiring shall conform to 6007219-300.
5. After the completion of this assembly work, color adjustments shall be conducted.

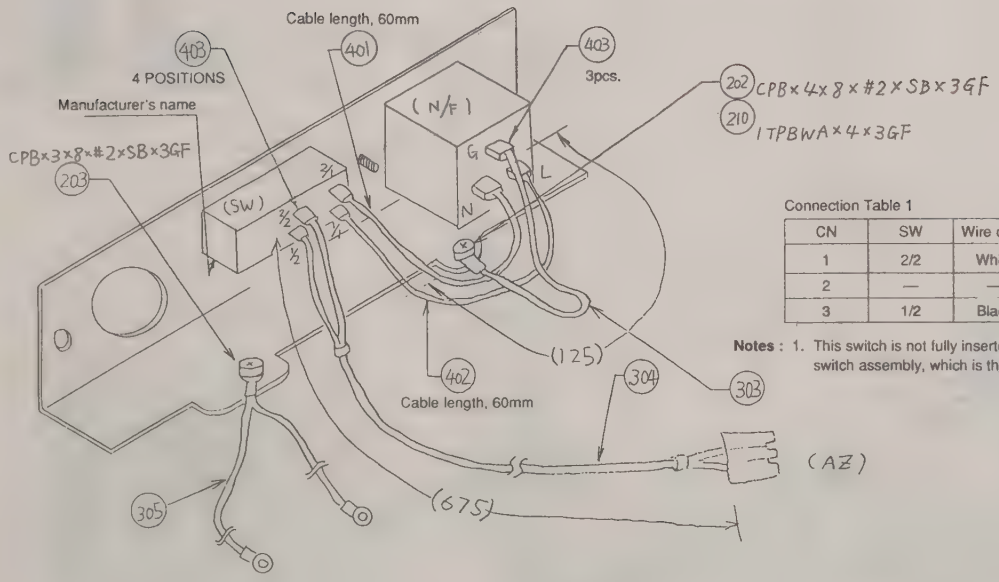


REQUD	PART NO	DESCRIPTION	REMARKS
1	6503503000	OPTICAL UNIT ASSY	
1	6072918000	DUCT 2	
1	6072937000	DUCT 1	
1	6544477000	INLET DUCT	
1	6503483001	SENSOR ASSY 1	
1	6503483002	SENSOR ASSY 2	
1	6544543000	DUCT SEAL (1)	
1	6544544000	DUCT SEAL (2)	
1	6503486000	FRONT PANEL ASSY	
1	6503479000	LAMP HOUSE ASSY	
1	6503484000	LAMP BALLAST ASSY	
3	6533088000	STAD	
1	6050726102	MAIN PWB ASSY	
1	6050732101	PS PWB	
1	6050730100	TERM PWB ASSY	
1	6050812000	INTER PWB ASSY	
2	6073240000	FITTING METAL C	
6	6658700597	SPACER	
1	6658700551	SPACER	



RE-QUI	PART NO	DESCRIPTION	REMARKS
1	6658X00902	SPACER	
4	6658600142	CLAMP, CABLE	
4	6658600143	CLAMP, CABLE	
17	6656150380	SCREW	
15	6654[illegible]300	SCREW	
7	8120[illegible]0007	SCREW	
4	6654[illegible]326	SCREW	
4	6654[illegible]421	SCREW	
2	6656[illegible]570	SCREW	
2	6654[illegible]345	TAPPING SCREW	
1	6654[illegible]3006	FAN, AXIAL (DC)	
1	6654[illegible]3006	FAN, AXIAL (DC)	
1	6654103981	CABLE ASSY	
1	6654103979	CABLE ASSY	
1	6654[illegible]0975	CABLE ASSY	
1	6654[illegible]3982	CABLE ASSY	
1	6654[illegible]1968	CABLE ASSY	
1	6654[illegible]0973	CABLE ASSY	
1	6654103967	CABLE ASSY	
1	6654103980	CABLE ASSY	
1	6654103977	CABLE ASSY	
1	6654103978	CABLE ASSY	
1	6654103970	CABLE ASSY	
1	6654[illegible]3976	CABLE ASSY	
ADJ 1	LMB 3055	ADJUSTMENT ASSY	
ADJ 1	LOP-[illegible]2376	K12N05 UNIT WORKING BOND	





Connection Table 1

CN	SW	Wire color
1	2/2	White
2	—	—
3	1/2	Black

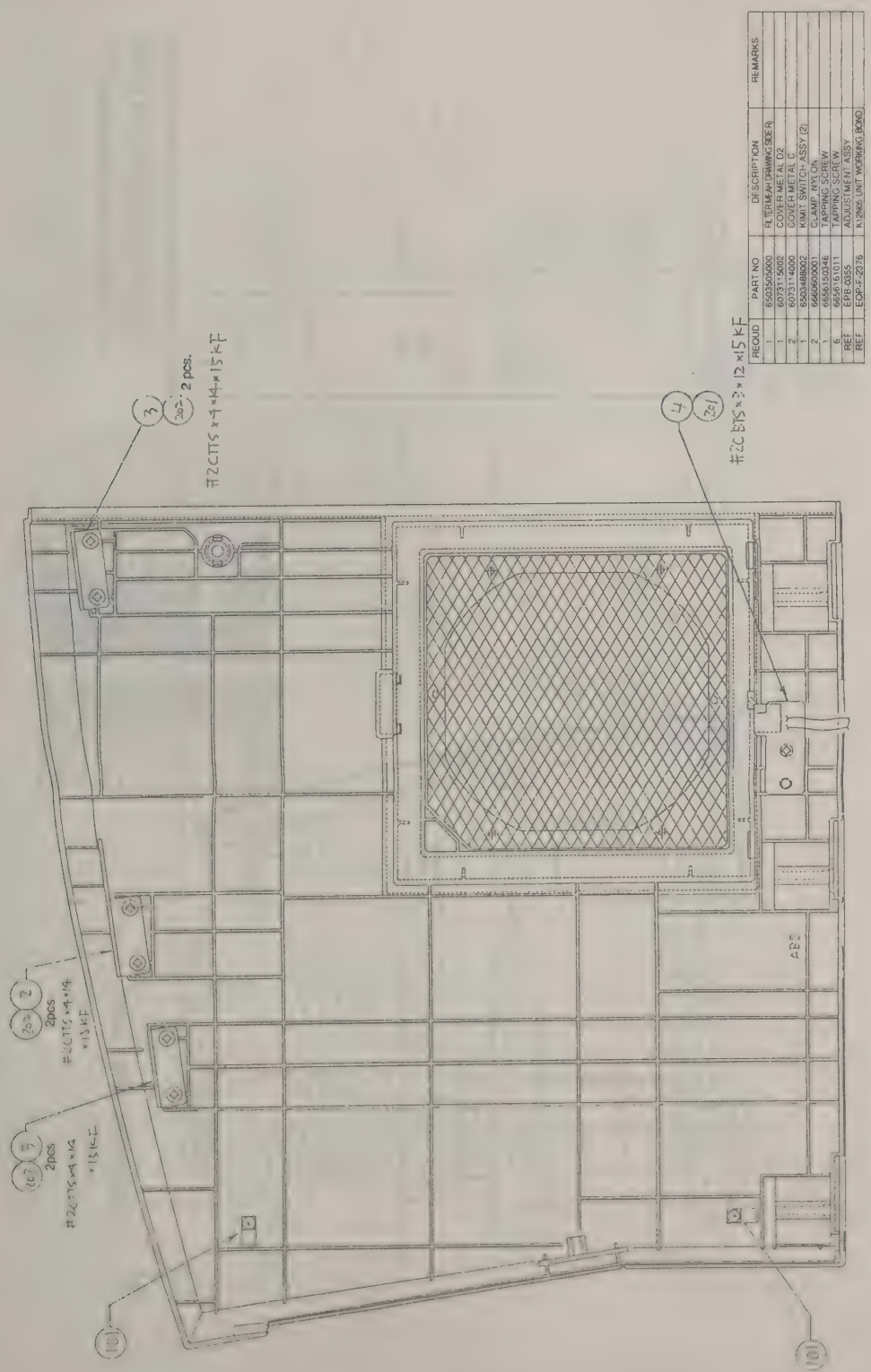
Connection Table 2

SW	N/F	Wire color
2/1	N	White
1/1	L	Black

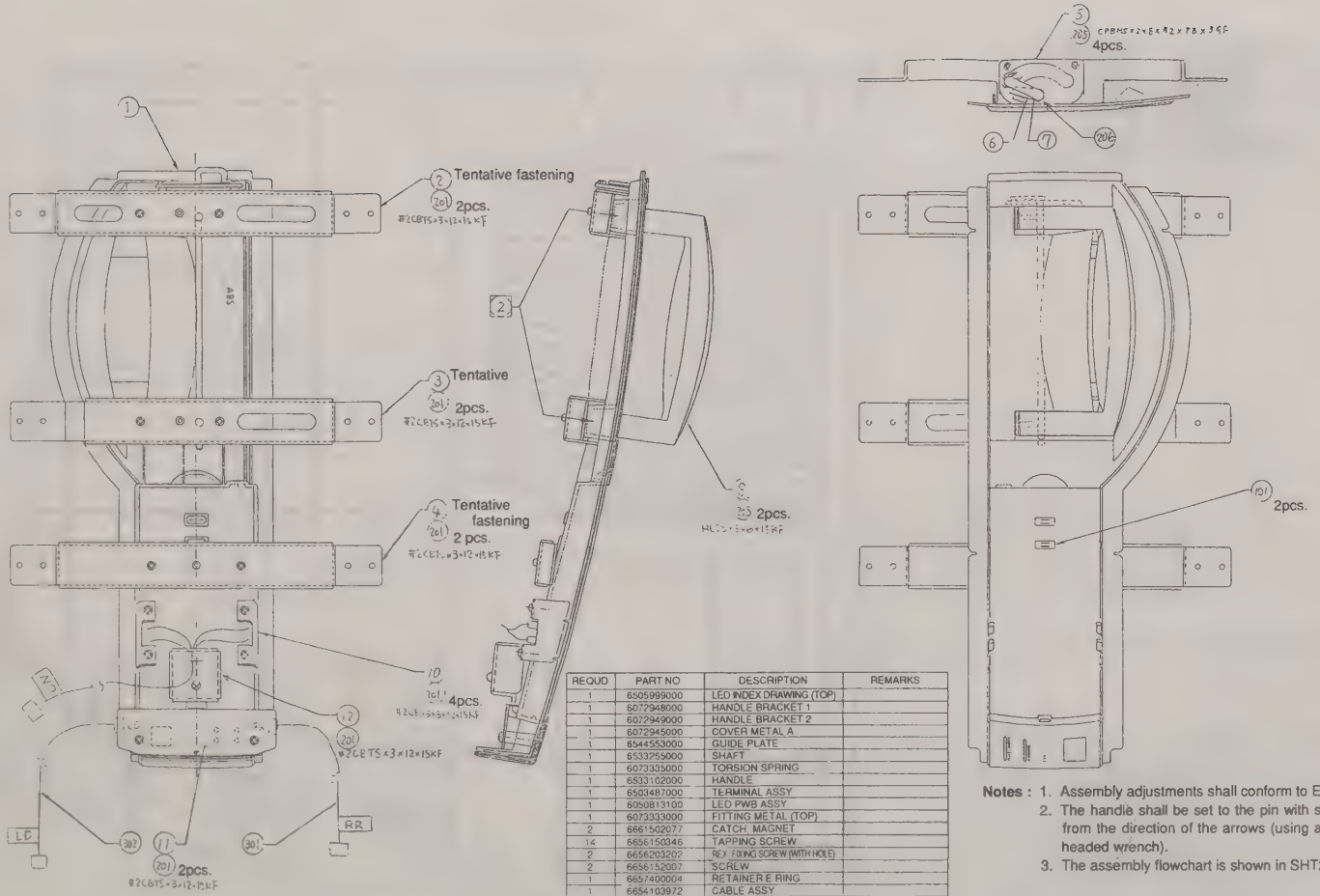
Notes : 1. This switch is not fully inserted to the depth, but tentatively fastened because it is firstly mounted on the switch assembly, which is then mounted on the base.

REQUD	PART NO	DESCRIPTION	REMARKS
1	6072951000	POWER SW BRACKET	
2	6656150370	SCREW	
1	6656151408	SCREW	
1	6656151308	SCREW	
1	8304383000	WASHER	
1	6640801056	SWITCH, SEESAW	
1	6645500161	FILTER, RFI	
1	6654113008	CABLE ASSY	
1	6654113007	CABLE ASSY	
1	6654103984	CABLE ASSY	
0	6627539166	WIRE ELEC INSULATED	
0	6627539177	WIRE ELEC INSULATED	
0	6666000249	TUBE, HEAT SHRIN KABLE	
REF	EPB-0355	ADJUSTMENT ASSY	
REF	EOP-F-2376	K12N05 UNIT WORKING BOND	

SIDE COVER (R) ASSEMBLY



REQUD	PART NO	DESCRIPTION	REMARKS
1	6503505000	ALTERNATIVE DRAWING SIDE R	
1	60731-5002	COVER METAL D2	
2	60731-4000	COVER METAL C	
2	6505308000	CLAMP NYLON ASSY (2)	
2	6505308001	CLAMP NYLON ASSY	
1	6656150346	TAPPING SCREW	
6	6656151011	TAPPING SCREW	
REF	EPR 0355	ADJUSTMENT ASSY	
REF	EQP-F-2976	K12N6 UNIT WORKING BOND	



REQUD	PART NO	DESCRIPTION	REMARKS
1	6505999000	LED INDEX DRAWING (TOP)	
1	6072948000	HANDLE BRACKET 1	
1	6072949000	HANDLE BRACKET 2	
1	6072945000	COVER METAL A	
1	6544553000	GUIDE PLATE	
1	6533255000	SHAFT	
1	6073335000	TORSION SPRING	
1	6533102000	HANDLE	
1	6503487000	TERMINAL ASSY	
1	6050813100	LED PWB ASSY	
1	6073333000	FITTING METAL (TOP)	
2	6661502077	CATCH, MAGNET	
14	6656150346	TAPPING SCREW	
2	6656203202	REX FIXING SCREW (WITH HOLE)	
2	6656152007	SCREW	
1	6657400004	RETAINER E RING	
1	6654103972	CABLE ASSY	
1	6654103974	CABLE ASSY	
REF	EPB-0355	ADJUSTMENT ASSY	
REF	EOP-F-2376	K12N05 UNIT WORKING BOND	

Notes :
1. Assembly adjustments shall conform to EPB-0355.
2. The handle shall be set to the pin with set screws from the direction of the arrows (using a hexagon-headed wrench).
3. The assembly flowchart is shown in SHT2/2.

Assembly Flowchart

① Tentatively fasten Handle Bracket 1 ②, Handle Bracket 2 ③, and Cover Fitting A ④ to Top Cover ①.

② Tentatively fasten Set Screw (203) to Handle ⑧. (See Fig. 1.)

③ Pass Shaft ⑥ through Torsion Spring ⑦ and Guide Plate ⑤. (See Fig. 20.)

④ Pass shaft ⑥ through Handle Bracket 1 and Handle Bracket 2 in this order. Tentatively fasten the guide plate to Handle bracket 1. At that time, the torsion spring shall be made to hang on the handle bracket and the shorter portion of the shaft. After that, fix the shaft to the guide plate, using E Ring (206).

⑤ Hold Handle ⑧ to stand upright and fix it to shaft ⑥, using Set Screw (203) tentatively fastened. In this case, confirm that the tip of the set screw has assuredly entered the shaft hole. (Note 2) (Fig. 22) After this confirmation, firmly tighten the guide plate.

⑥ Mount Terminal Assembly ⑩. Fasten it with a screw, making sure the gold-colored spring is not caught by the hole edge.

⑦ Mount Fitting (top) 6073333 ⑫.

⑧ Mount LED PWB ⑪.

⑨ Mount Catch Magnet (101).

Note 21: Items ②, ③, and ④ shall be left mounted tentatively. Assembly work shall proceed to the next procedure (cover assembly). These items shall be regularly tightened at the next stage.

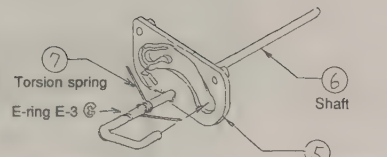


Fig. 20

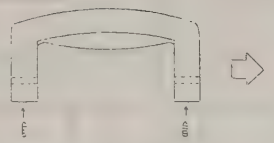


Fig. 21
(Tentative fastening)

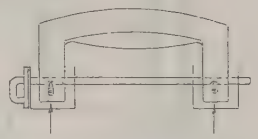
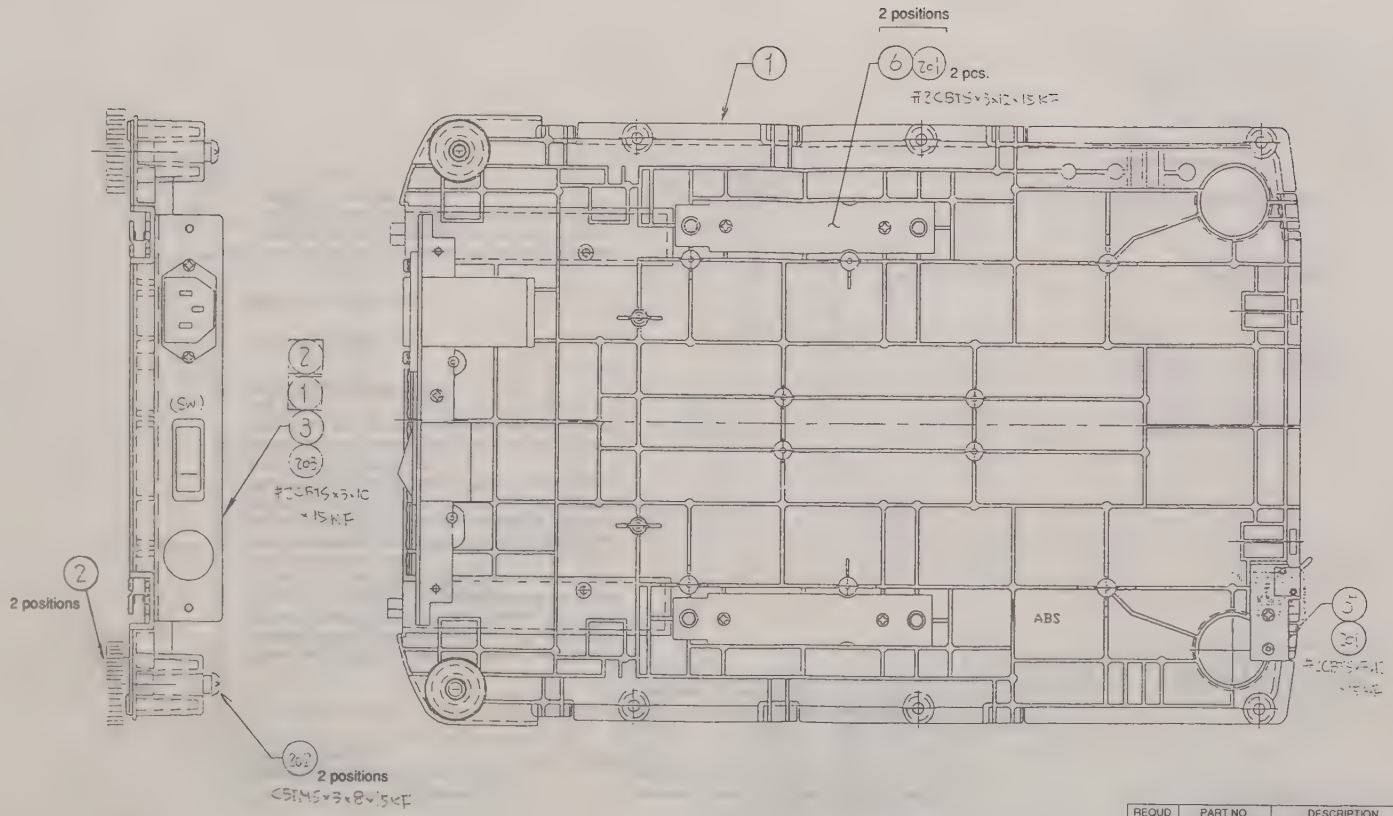


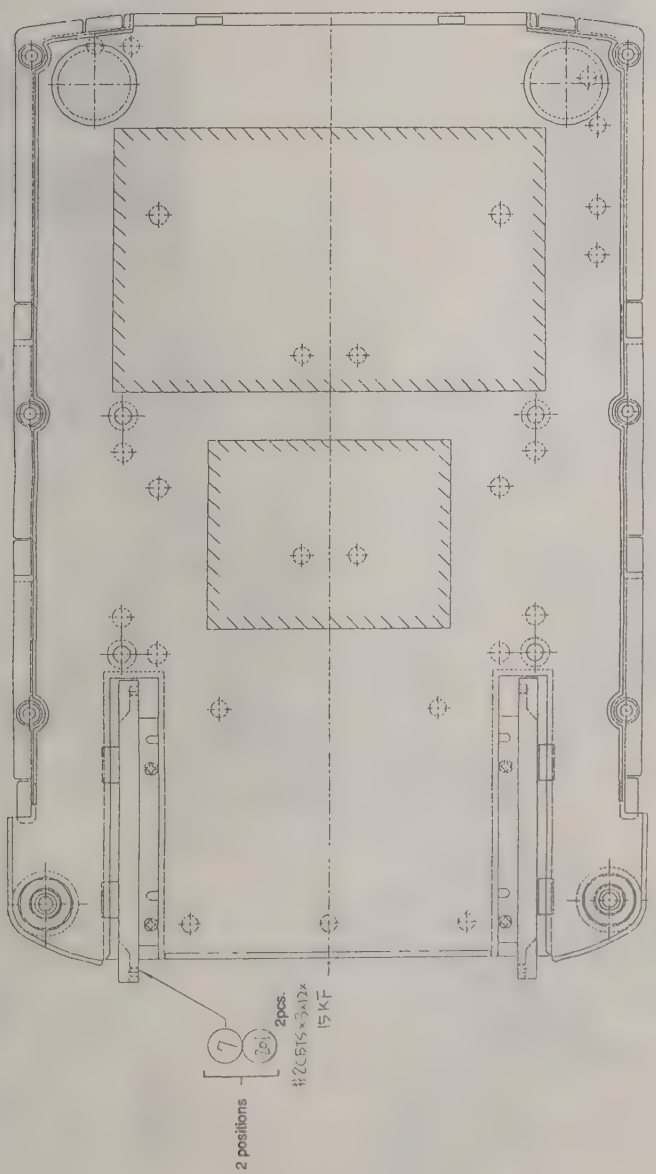
Fig. 22
(Regular fastening)

- Structural Disassembly Diagram
- Remarks
- Top Cover Assy



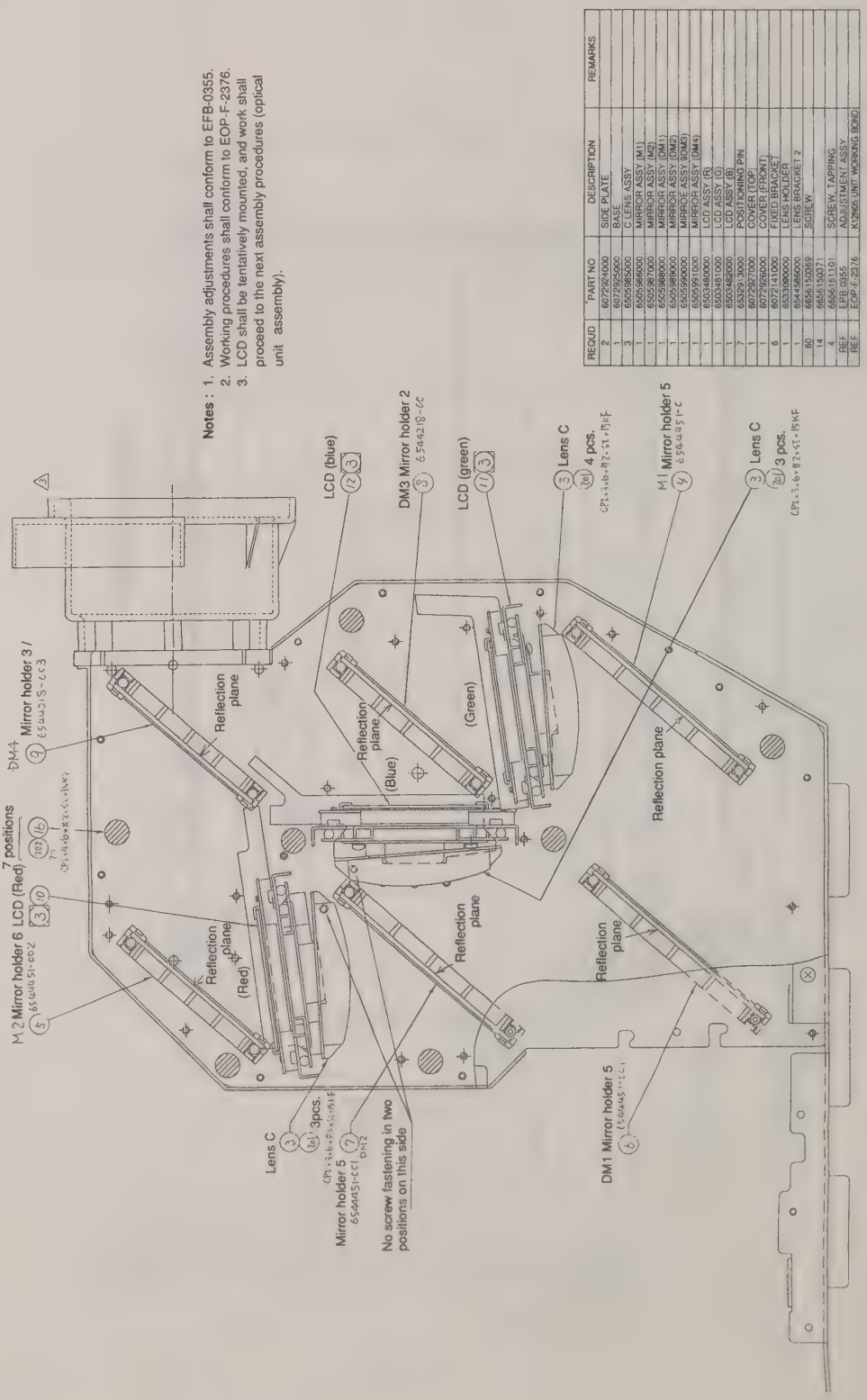
REQUD	PART NO	DESCRIPTION	REMARKS
1	6544455000	BOTTOM COVER	
2	6505997000	FOOT ASSY	
1	6503496000	POWER SW ASSY	
1	6503488001	LIMIT SWITCH ASSY (1)	
2	6516481000	HANGER PLATE	
2	6544474000	RAIL	
9	6656150346	TAPPING SCREW	
2	6656150707	SCREW	
1	6656150347	ADJUSTMENT ASSY	
REF	EPB-0355	ADJUSTMENT ASSY	
REF	EOP-F-2376	K12N05 UNIT WORKING BOND	

Notes : (1) Working order: After mounting POWER SW Assembly ③, Rail ⑦ shall be mounted. Both ③ and ⑦ shall be tightened together
(2) When mounting Item ③, the switch shall be removed from the bracket.After it has been fastened with screws, it shall be set in position again.



Drawing as seen from the bottom

MIRROR UNIT ASSEMBLY


Notes : 1. Assembly adjustments shall conform to EFB-0355.
2. Working procedures shall conform to EOP-F-2376.
3. LCD shall be tentatively mounted, and work shall proceed to the next assembly procedures (optical unit assembly).
M2 Mirror holder 6 LCD (Red) 7 positions
M4 Mirror holder 3
Reflection plane
(Red)
(Blue)
(Green)
LCD (blue)
LCD (green)
DM3 Mirror holder 2
Lens C 4 pcs.
M1 Mirror holder 5
Lens C 3 pcs.
Lens C 3pcs.
Mirror holder 5
No screw fastening in two positions on this side
DM1 Mirror holder 5

REQUD	*PART NO	DESCRIPTION	REMARKS
2	6072924000	SIDE PLATE	
2	6072925000	BASE	
3	6505985000	C LENS ASSY	
1	6505986000	MIRROR ASSY (M1)	
1	6505987000	MIRROR ASSY (M2)	
1	6505988000	MIRROR ASSY (DM1)	
1	6505989000	MIRROR ASSY (DM2)	
1	6505990000	MIRROR ASSY (DM3)	
1	6505991000	MIRROR ASSY (DM4)	
1	6503486000	LCD ASSY (R)	
1	6503487000	LCD ASSY (G)	
1	6503488000	LCD ASSY (B)	
7	6532913000	POSITIONING PIN	
1	6072927000	COVER (TOP)	
1	6072926000	COVER (FRONT)	
6	6072141000	FIXED BRACKET	
1	6533090000	LENS HOLDER	
1	6544586000	LENS BRACKET 2	
60	6656150869	SCREW	
14	6656139311	SCREW, TAPPING	
REF	EFB 0355	ADJUSTMENT, ASSY	
REF	EOP-F-2376	K2N05 UNIT WORKING BOND	

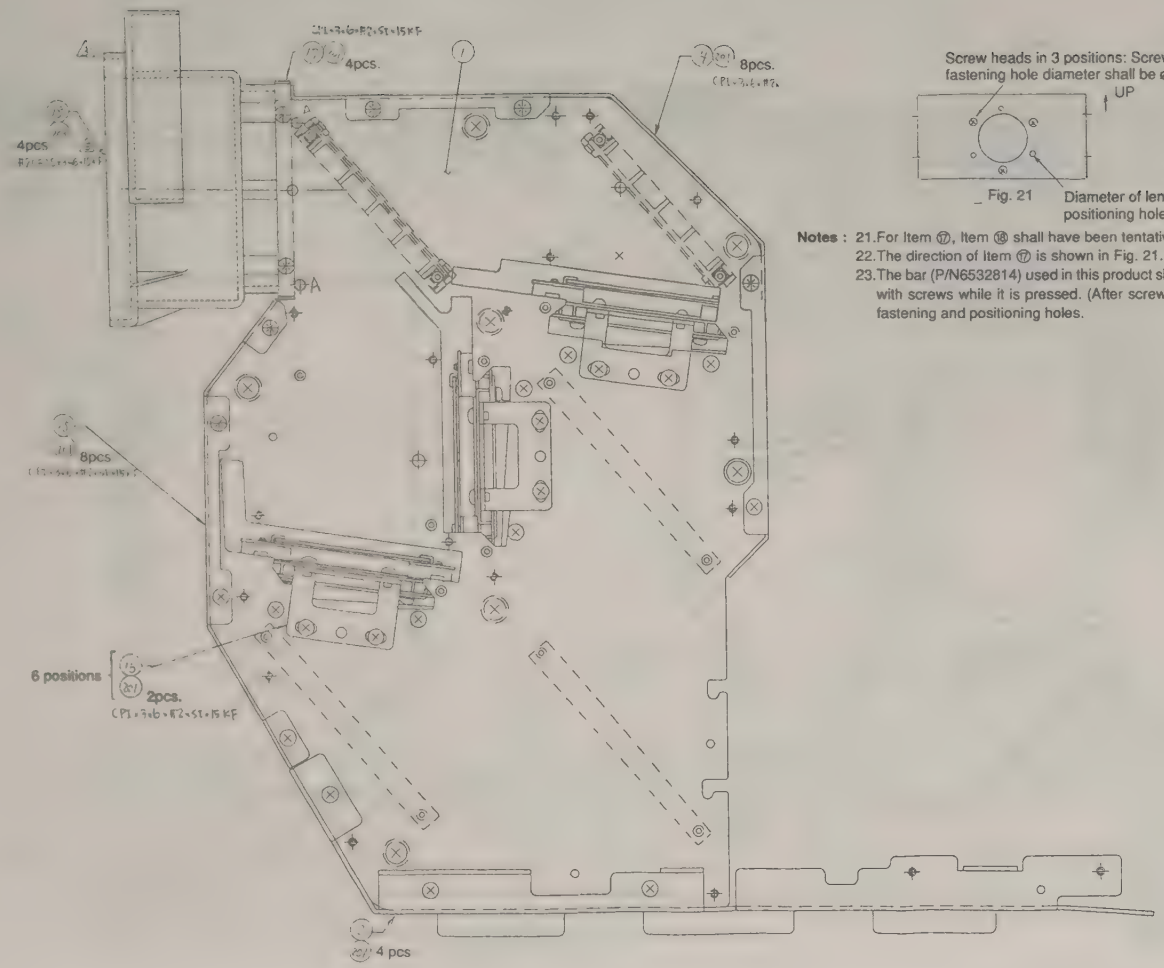
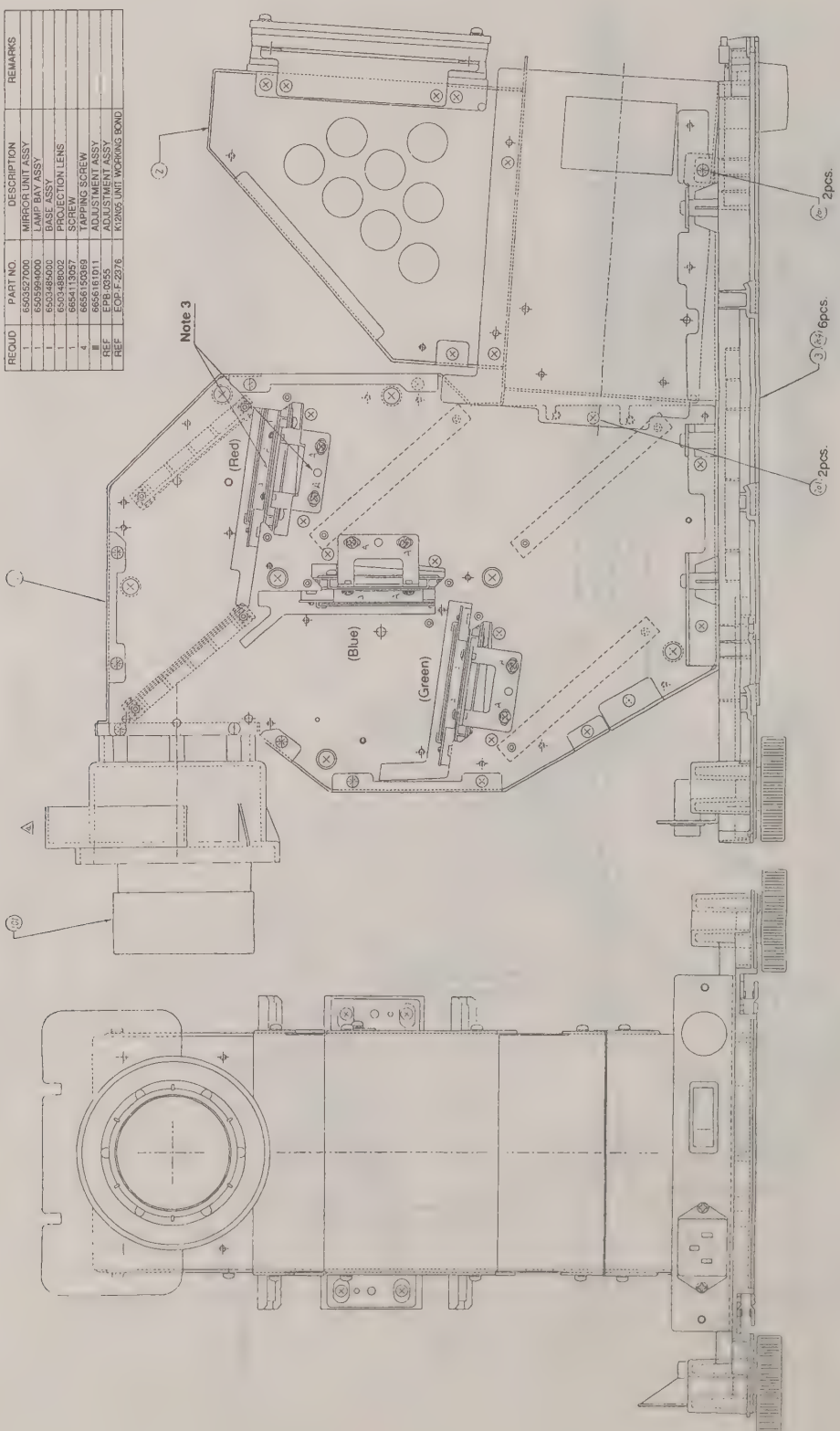


Fig. 21

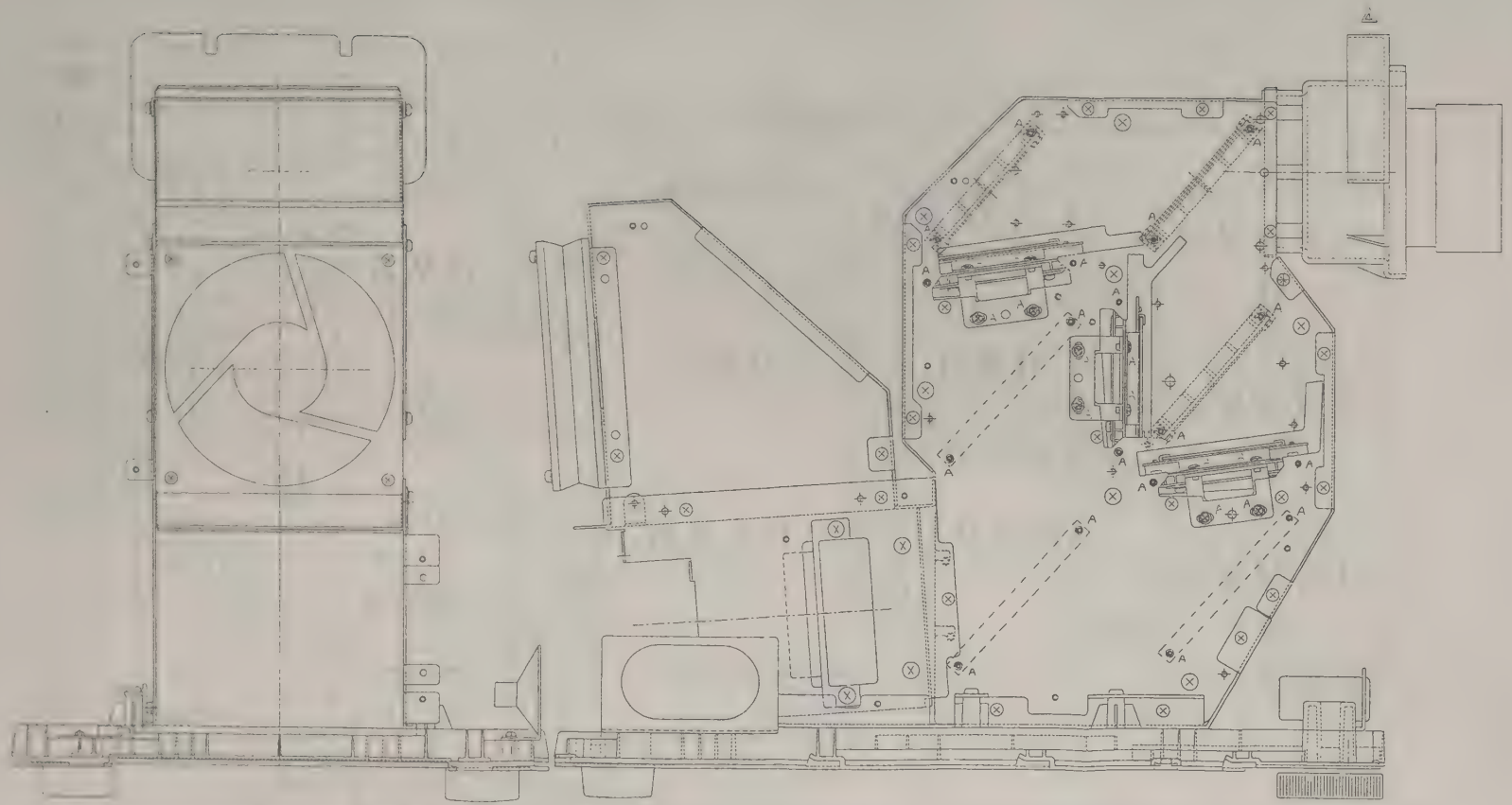
Diameter of lens bracket positioning hole shall be ϕ 3.3.

Notes : 21.For Item ⑰, Item ⑱ shall have been tentatively mounted.
22.The direction of Item ⑰ is shown in Fig. 21.
23.The bar (P/N6532814) used in this product shall be inserted in Hole A, and then Item ⑰ shall be fastened with screws while it is pressed. (After screw fastening, the bar shall be pulled out.) Confirm the screw-fastening and positioning holes.

MIRROR UNIT ASSEMBLY

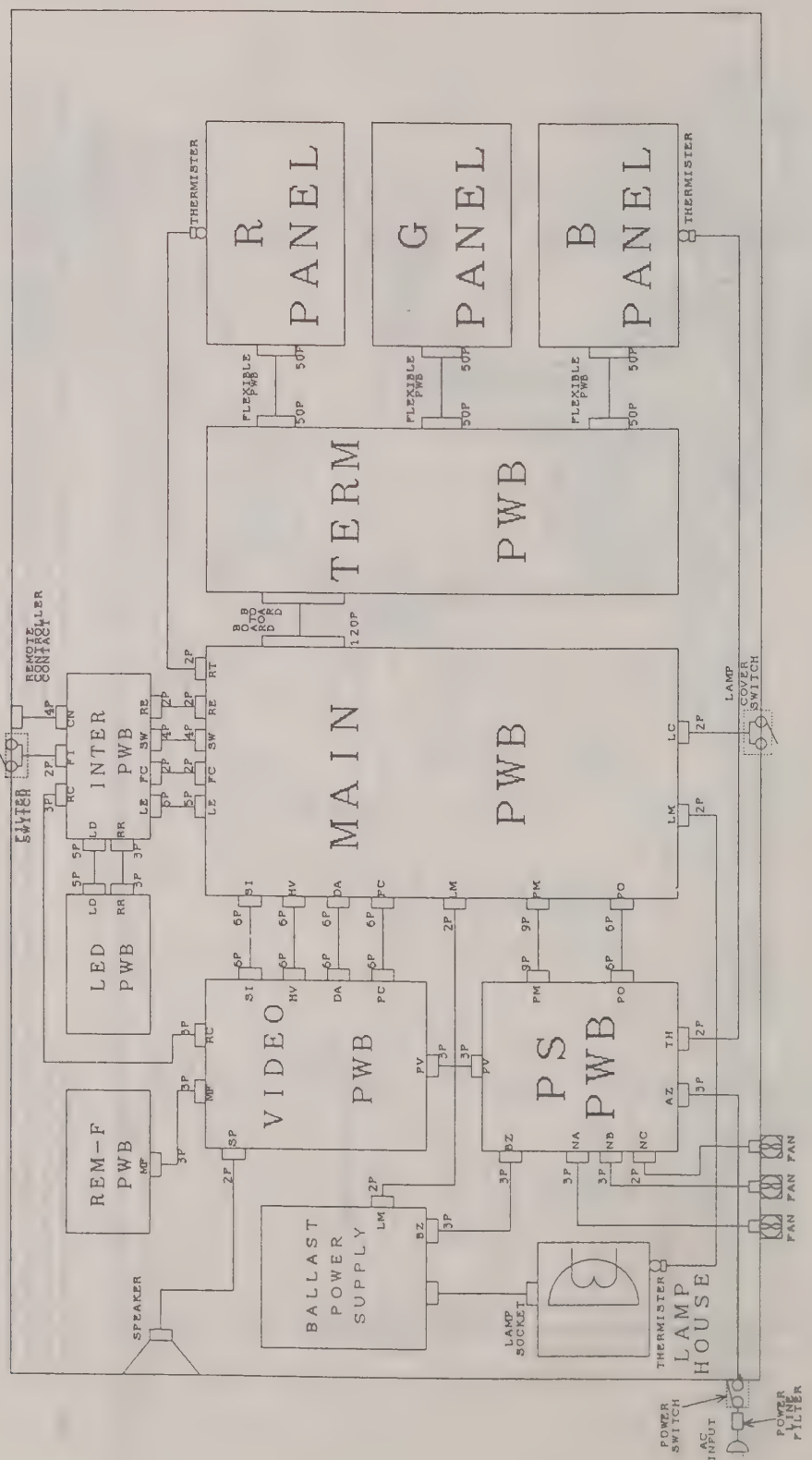


REQUD	PART NO.	DESCRIPTION	REMARKS
1	6503627000	MIRROR UNIT ASSY	
1	6505994000	LAMP BAY ASSY	
1	6503485000	BASE ASSY	
1	6503488002	PROJECTION LENS	
1	6654113057	SCREW	
4	6656150369	TAPPING SCREW	
■	6656161011	ADJUSTMENT ASSY	
REF	EPB-0055	ADJUSTMENT ASSY	
REF	EOP-F-2376	KYANG UNIT WORKING BOND	

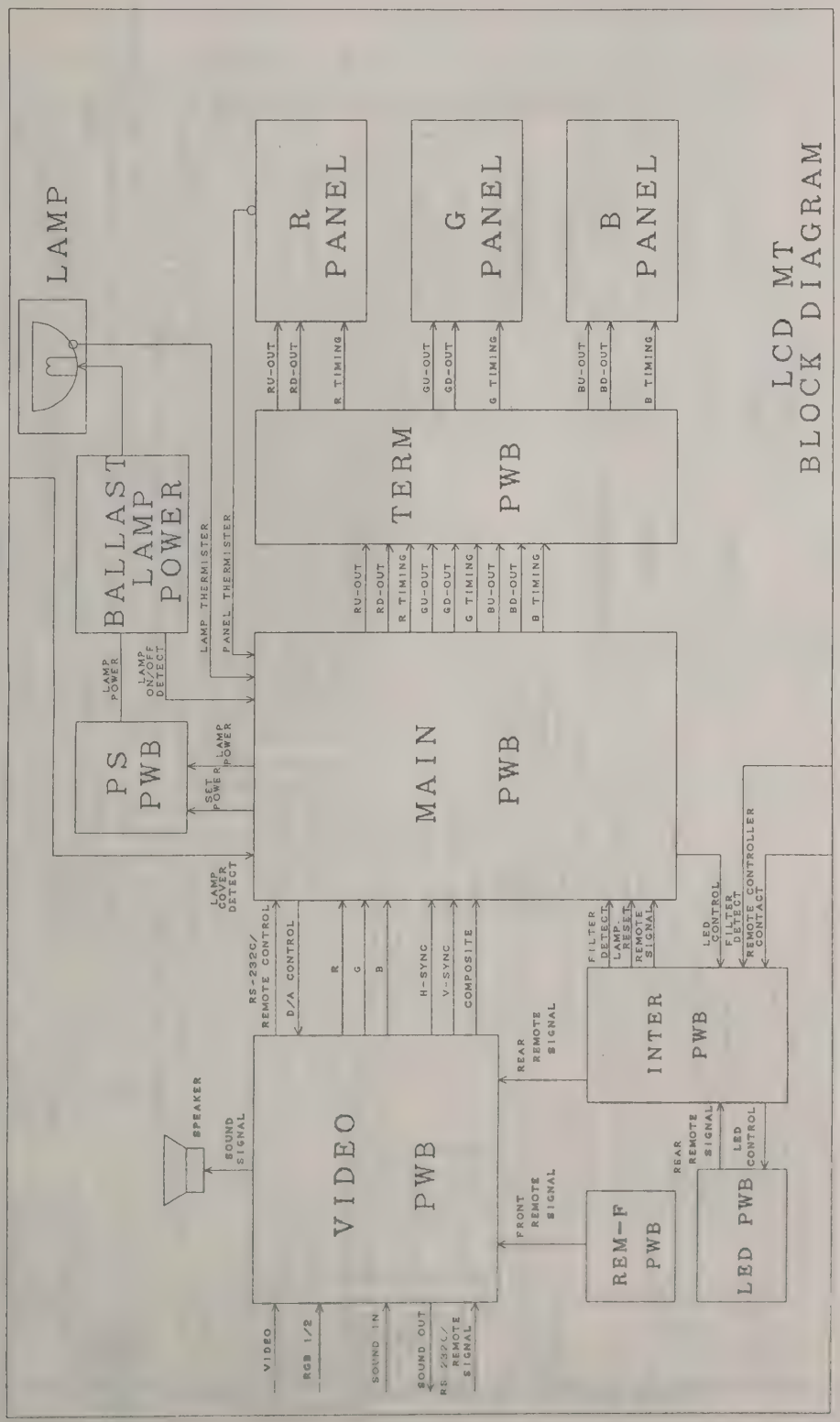


Notes : 1. Assembly adjustments shall conform to EPB-0355.
2. Working procedures shall conform to ECP-F-2376.
3. After the completion of this assembly work, picture element arrangements shall be effected. The red panel shall be fastened with screws, by inserting the picture element fitting pin (P/N6532876) in the hole specified in Note 3. Since then, color arrangements for blue and green shall be carried out on the basis of the red panel, using the picture element arrangement jig (P/N6533118-001,002).
4. After picture element arrangements, the screw indicated by Mark A shall be tightened at a tightening torque of 8.5kgf.cm. After that, the screw setting agent Type 2 Class B (Lock-Tight 1403B) shall be applied to screws and bars (44 positions in total). The working specification shall be of NPB-4,5. For bars, however, this agent shall be applied only to a single side (SHT-2/2 plane).

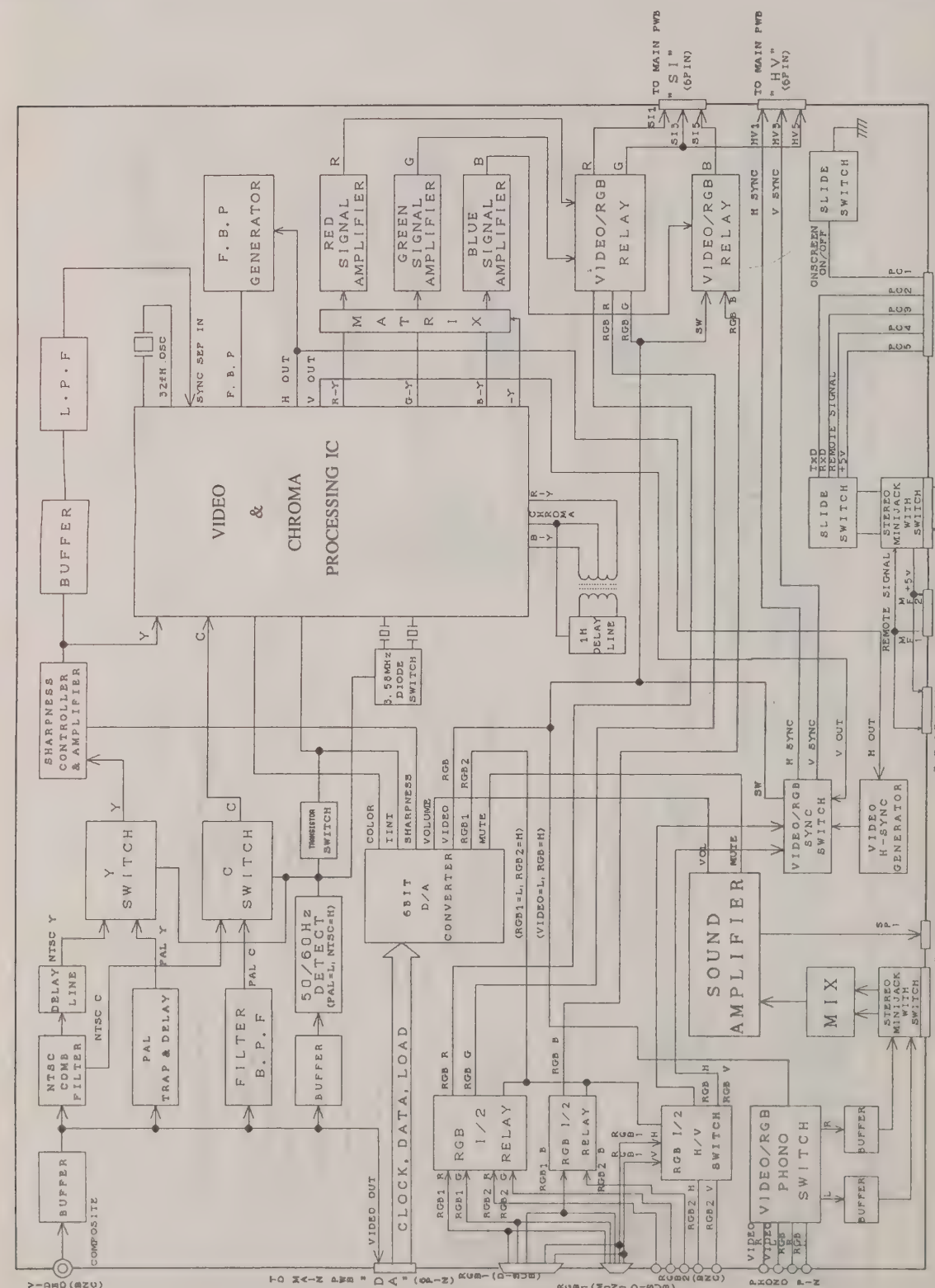
CONNECTION DIAGRAM



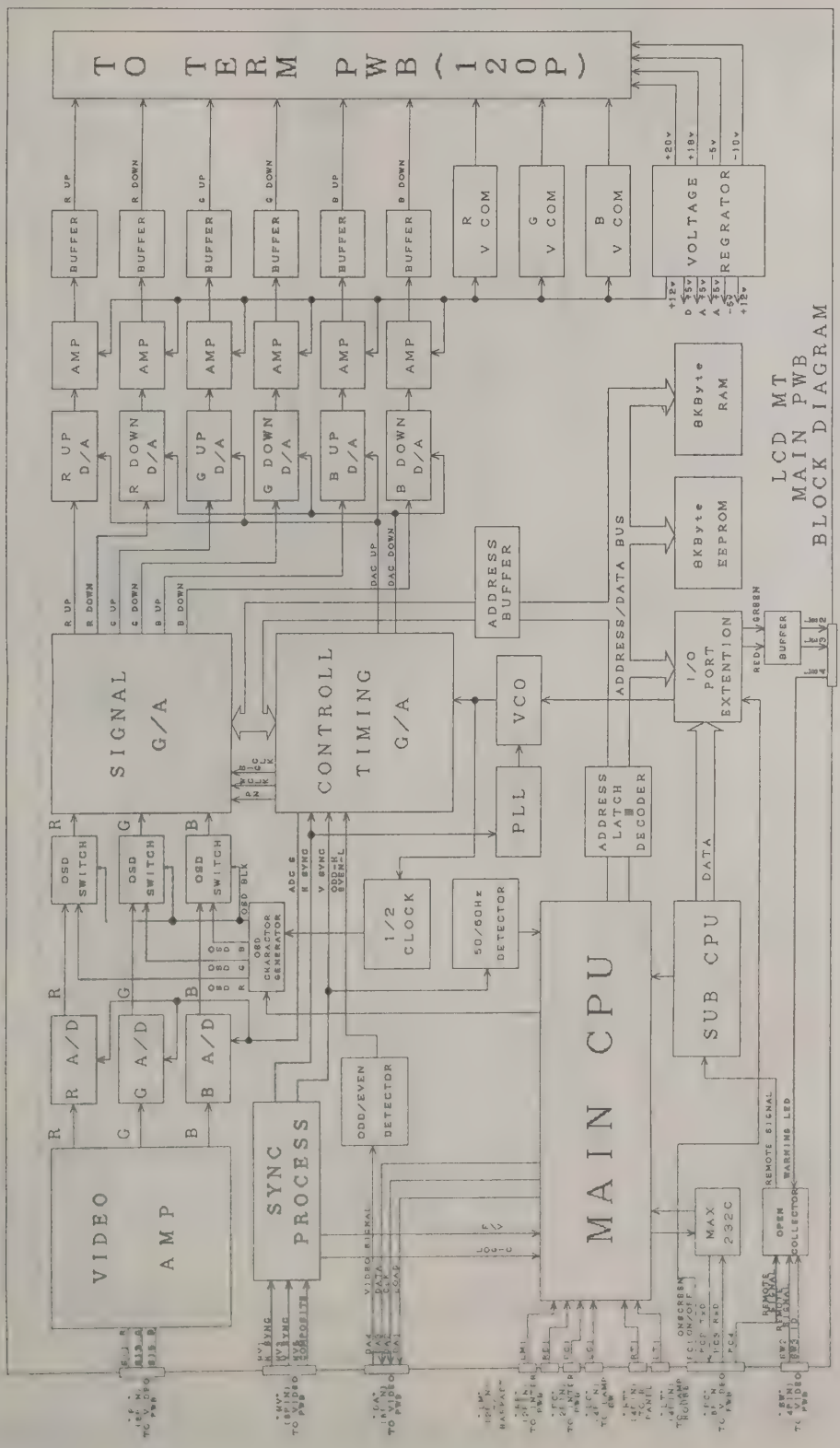
SET LEVEL


LCD MT
BLOCK DIAGRAM
LAMP
BALLAST
LAMP
POWER
PS
PWB
R
PANEL
G
PANEL
B
PANEL
TERM
PWB
MAIN
PWB
VIDEO
PWB
INTER
PWB
REM-F
PWB
LED PWB
SPEAKER
LAMP THERMISTER
PANEL THERMISTER
LAMP POWER
LAMP ON/OFF DETECT
SET POWER
LAMP COVER DETECT
RU-OUT
RD-OUT
R TIMING
GU-OUT
GD-OUT
G TIMING
BU-OUT
BD-OUT
B TIMING
RS-232C/ REMOTE CONTROL
D/A CONTROL
R
G
B
H-SYNC
V-SYNC
COMPOSITE
SOUND SIGNAL
REAR REMOTE SIGNAL
FRONT REMOTE SIGNAL
FILTER DETECT
LAMP RESET
REMOTE SIGNAL
LED CONTROL
REMOTE CONTROLLER CONTACT
VIDEO
RGB 1/2
SOUND IN
SOUND OUT
RS-232C/ REMOTE SIGNAL

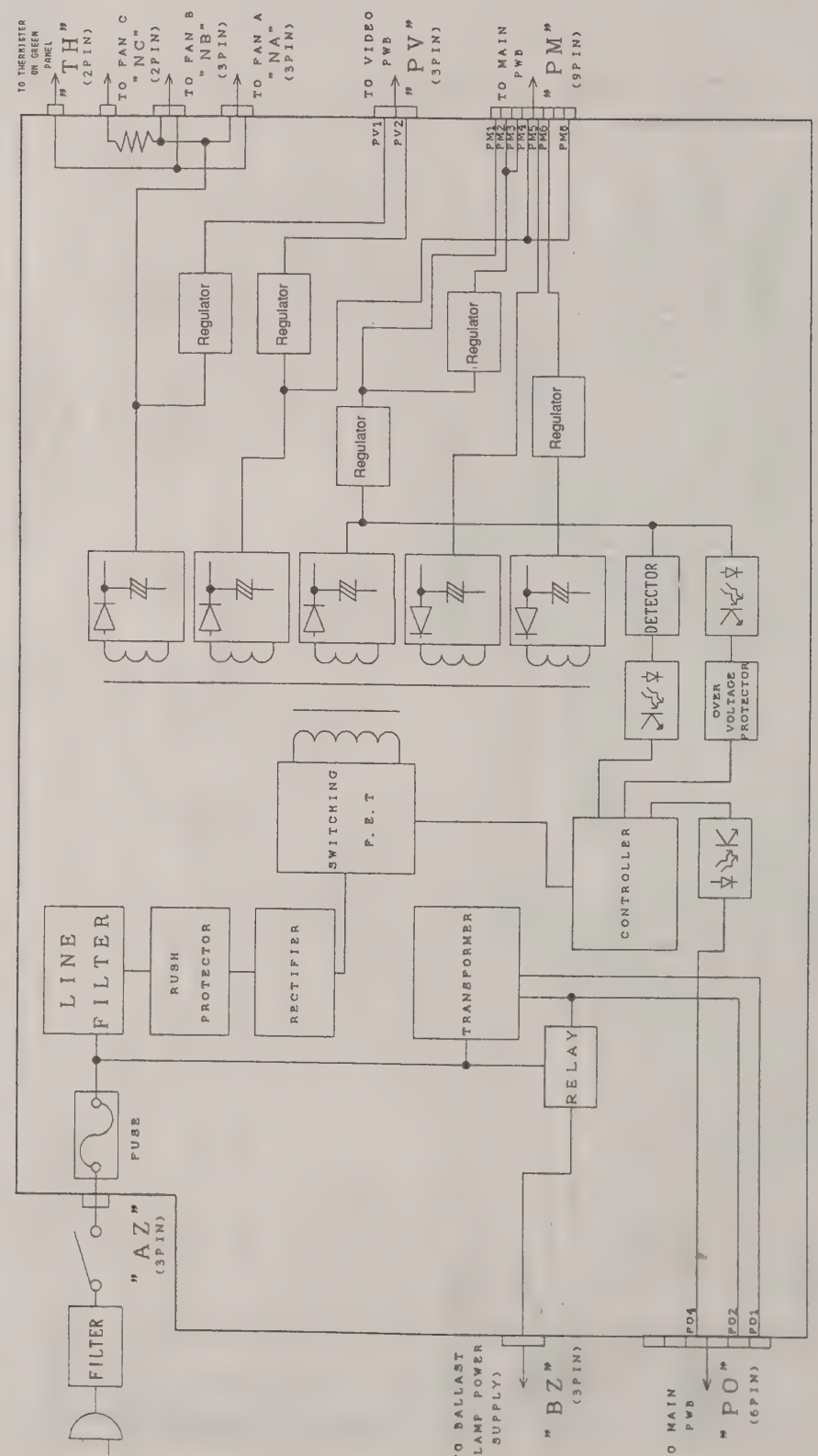
VIDEO PWB


VIDEO & CHROMA PROCESSING IC
F. B. P GENERATOR
RED SIGNAL AMPLIFIER
GREEN SIGNAL AMPLIFIER
BLUE SIGNAL AMPLIFIER
MATRIX
VIDEO/RGB RELAY
VIDEO/RGB RELAY
L. P. F
BUFFER
32fH OSC
SYNC SEP IN
F. B. P
H OUT
V OUT
R-Y
G-Y
B-Y
-Y
SHARPNESS CONTROLLER & AMPLIFIER
3.58MHz DIODE SWITCH
1H DELAY LINE
Y SWITCH
C SWITCH
TRANSISTOR SWITCH
COLOR
TINT
SHARPNESS
VOLUME
VIDEO
RGB1
MUTE
RGB2
6BIT D/A CONVERTER
(RGB1=L, RGB2=H)
(VIDEO=L, RGB=H)
NTSC COMB FILTER
PAL TRAP & DELAY
FILTER B.P.F
50/60Hz DETECT (PAL=L, NTSC=H)
DELAY LINE
BUFFER
COMPOSITE
CLOCK, DATA, LOAD
VIDEO OUT
RGB 1/2 RELAY
RGB 1/2 RELAY
RGB 1/2 H/V SWITCH
SOUND AMPLIFIER
MIX
VOL
VIDEO/RGB SYNC SWITCH
VIDEO H-SYNC GENERATOR
H SYNC
V SYNC
V OUT
H OUT
VIDEO/RGB PHONO SWITCH
STEREO MINI JACK WITH SWITCH
SLIDE SWITCH
ON SCREEN ON/OFF
REMOTE SIGNAL
TXD
RXD
REMOTE SIGNAL
+5V
TO MAIN PWB "SI" (6PIN)
TO MAIN PWB "HV" (6PIN)
"PC" (6PIN) TO MAIN PWB
"RC" (3PIN) INTER PWB
"ME" (3PIN) TO REM-F PWB
"SP" (2PIN) TO SPEAKER

MAIN PWB

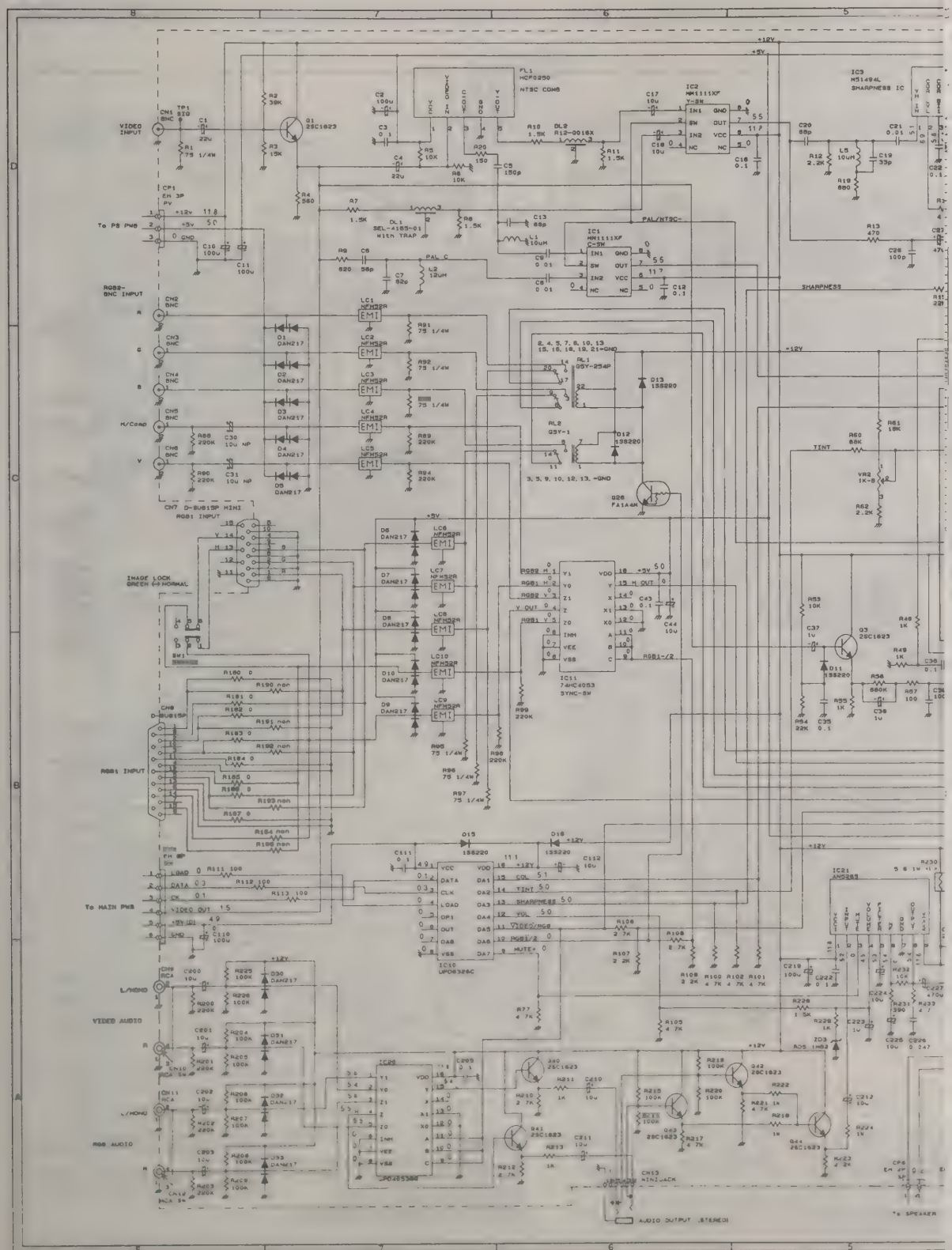

TO TERM PWB (120P)
BUFFER
R UP
R DOWN
G UP
G DOWN
B UP
B DOWN
R V COM
G V COM
B V COM
VOLTAGE REGRATOR
+20V
+18V
-5V
-10V
AMP
R UP D/A
R DOWN D/A
G UP D/A
G DOWN D/A
B UP D/A
B DOWN D/A
DAC UP
DAC DOWN
8KByte RAM
8KByte EEPROM
LCD MT
MAIN PWB
BLOCK DIAGRAM
ADDRESS BUFFER
ADDRESS/DATA BUS
SIGNAL G/A
CONTROLL TIMING G/A
I/O PORT EXTENTION
BUFFER
VCO
PLL
ADDRESS LATCH DECODER
DATA
OSD SWITCH
CHARACTOR GENERATOR
1/2 CLOCK
50/60Hz DETECTOR
MAIN CPU
SUB CPU
R A/D
G A/D
B A/D
VIDEO AMP
SYNC PROCESS
ODD/EVEN DETECTOR
MAX 232C
OPEN COLLECTOR
REMOTE SIGNAL
WARMING LED

PS PWB


TO THERMISTER ON GREEM PANEL
" TH " (2PIN)
TO FAN C " NC " (2PIN)
TO FAN B " NB " (3PIN)
TO FAN A " NA " (3PIN)
TO VIDEO PWB
" PV " (3PIN)
TO MAIN PWB
" PM " (9PIN)
PV1
PV2
PM1
PM2
PM3
PM4
PM5
PM6
PM9
Regulator
Regulator
Regulator
Regulator
Regulator
DETECTOR
OVER VOLTAGE PROTECTOR
SWITCHING P.E.T
CONTROLLER
LINE FILTER
RUSH PROTECTOR
RECTIFIER
TRANSFORMER
RELAY
FUSE
" AZ " (3PIN)
FILTER
TO BALLAST (LAMP POWER SUPPLY)
" BZ " (3PIN)
PD4
PD2
PD1
TO MAIN PWB
" PO " (6PIN)

SCHEMATIC DIAGRAMS

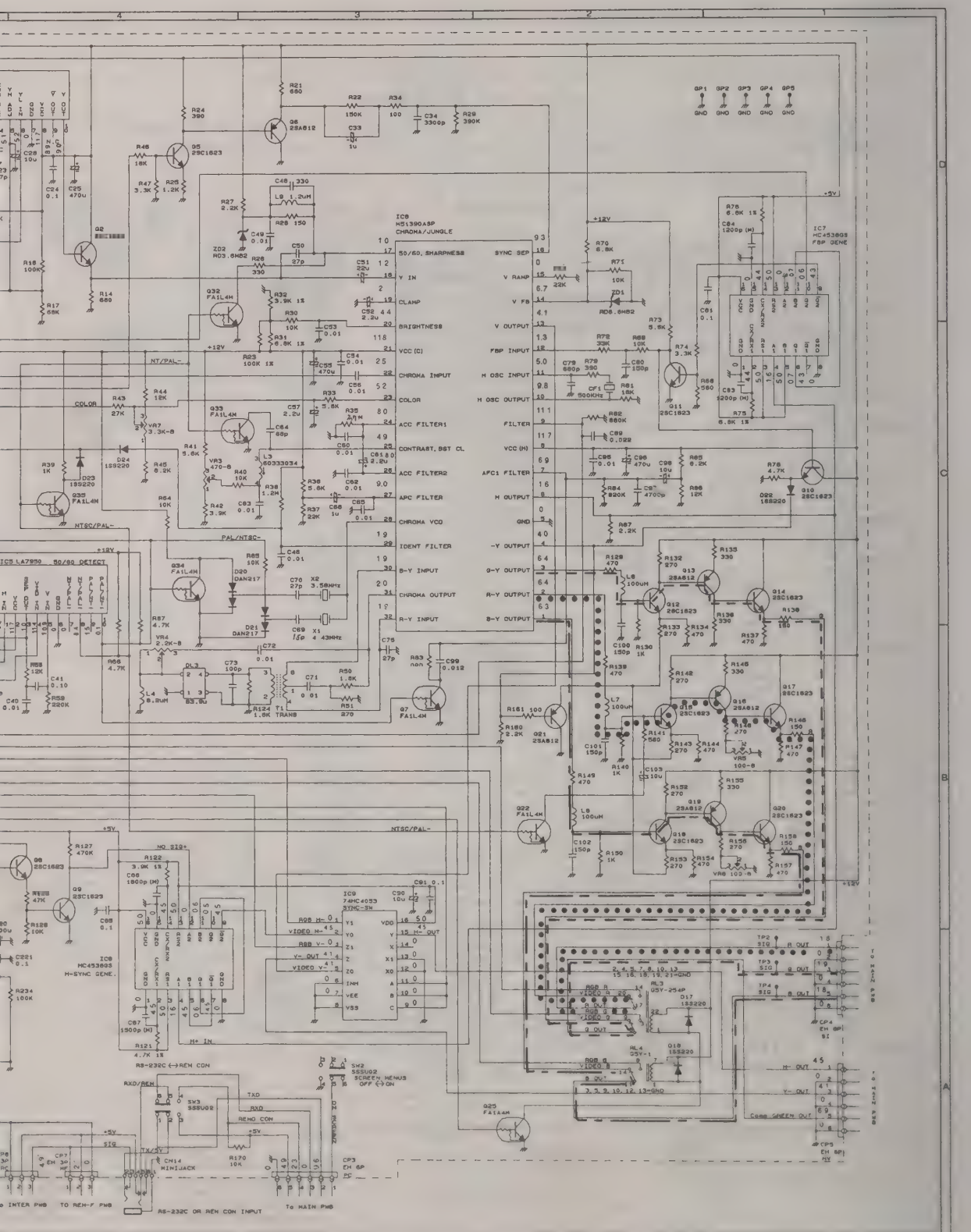
VIDEO PWB



NOTES

1. RESISTOR VALUES ARE IN Ω (OHM K=1 000) M=1 000 000)
2. ALL RESISTORS ARE 1/6W 1/8W EXCEPT WHERE OTHERWISE INDICATED
3. CAPACITOR VALUES ARE IN μF UNLESS OTHERWISE INDICATED P=
4. ALL CAPACITORS ARE 50VOLTS EXCEPT WHERE OTHERWISE INDICATED
5. VOLTAGES AND WAVEFORMS MEASURED UNDER FOLLOWING CONDITIONS
   INPUT SIGNAL IS STANDARD COLOR BAR CONTRAST CONTROL AND CONTROL EXCEPT CONTRAST ARE CENTER
   H HORIZONTAL RATE V VERTICAL RATE

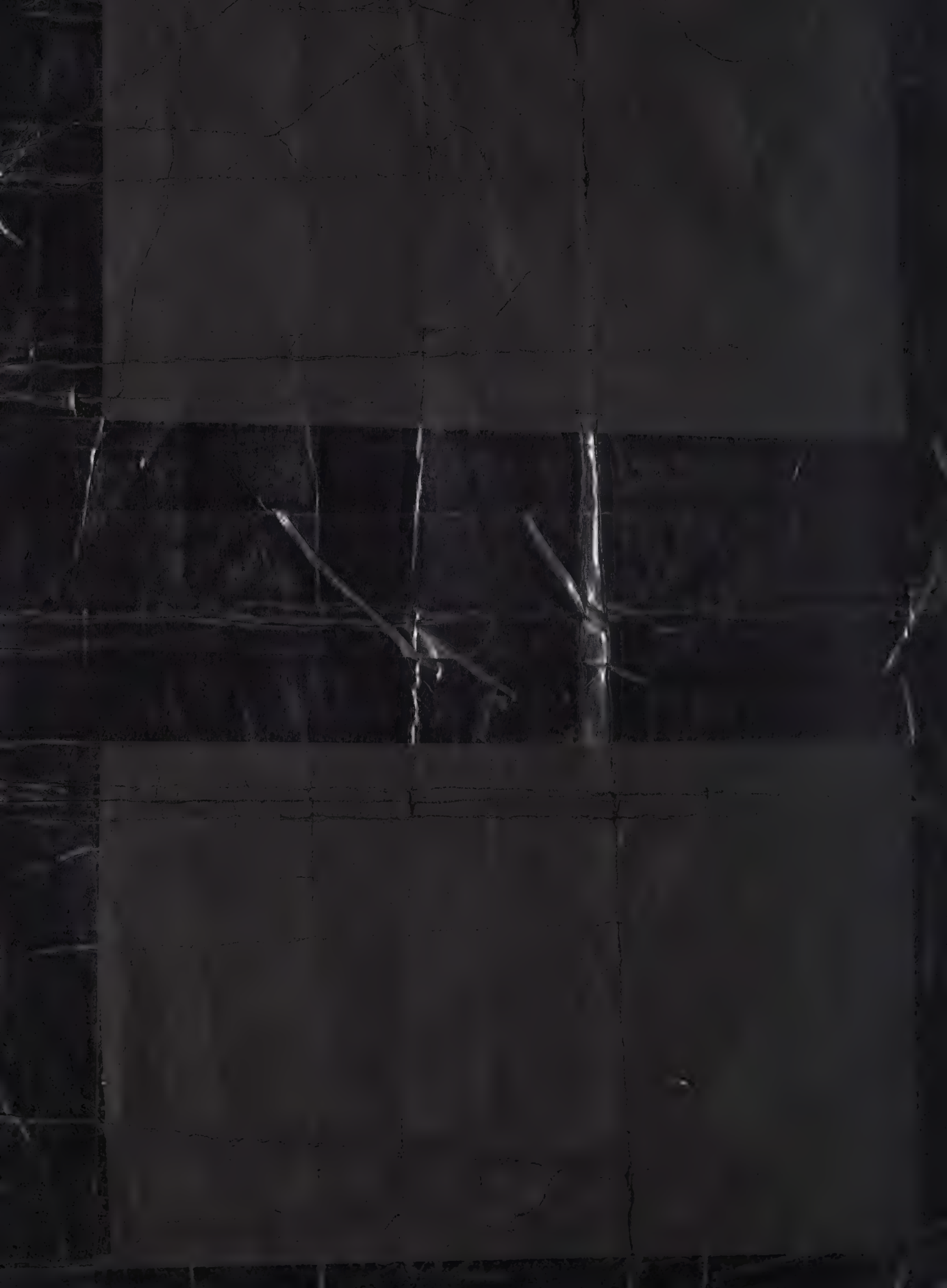
SCHEMATIC DIAGRAMS



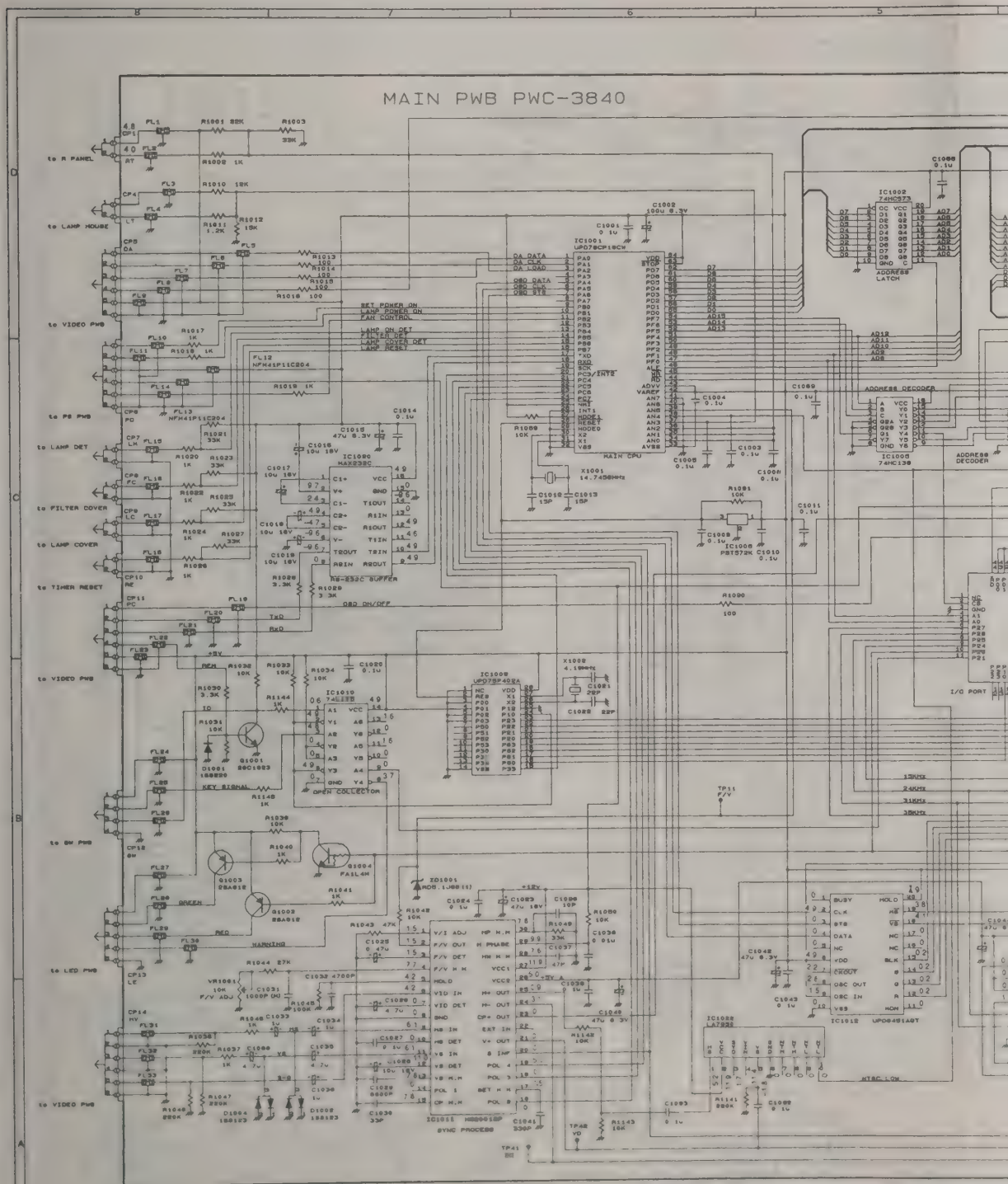
WARNING

REPLACEMENT PARTS WHICH HAVE SPECIAL SAFTY CHARACTERISTICS ARE IDENTIFIED BY
⚠SHADING ON THE SCHEMATICS

REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS



MAIN PWB (1/3)



NOTES

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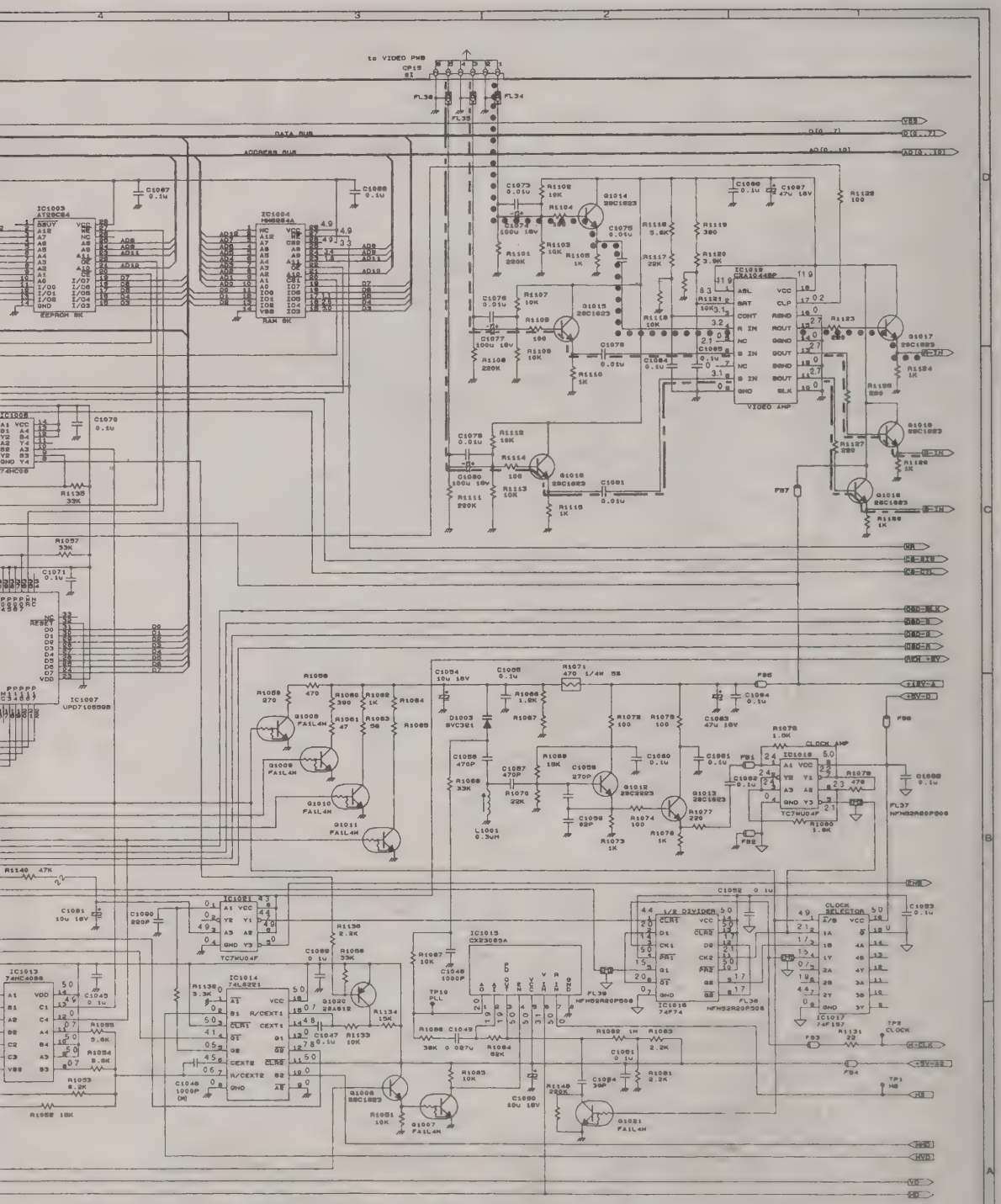
2. ALL RESISTORS ARE 1/6W, 1/8W EXCEPT WHERE OTHERWISE INDICATED.
3. CAPACITOR VALUES ARE IN μF UNLESS OTHERWISE INDICATED. P=PF
4. ALL CAPACIT… CEPT WHERE…
5. VOLTAGES A… SURED UNDE… TIONS INPUT SIGNA… BAR CONTRAS…



RS ARE 50VOLTS EX-
OTHERWISE INDICATED
D WAVEFORMS MEA-
FOLLOWING CONDI-

IS STANDARD COLOR
CONTROL IS 75% AND

CONTROL EXCEPT CONTRAST ARE CENTER

6. Ⓗ... HORIZONTAL RATE. Ⓥ... VERTICAL RATE.

WARNING

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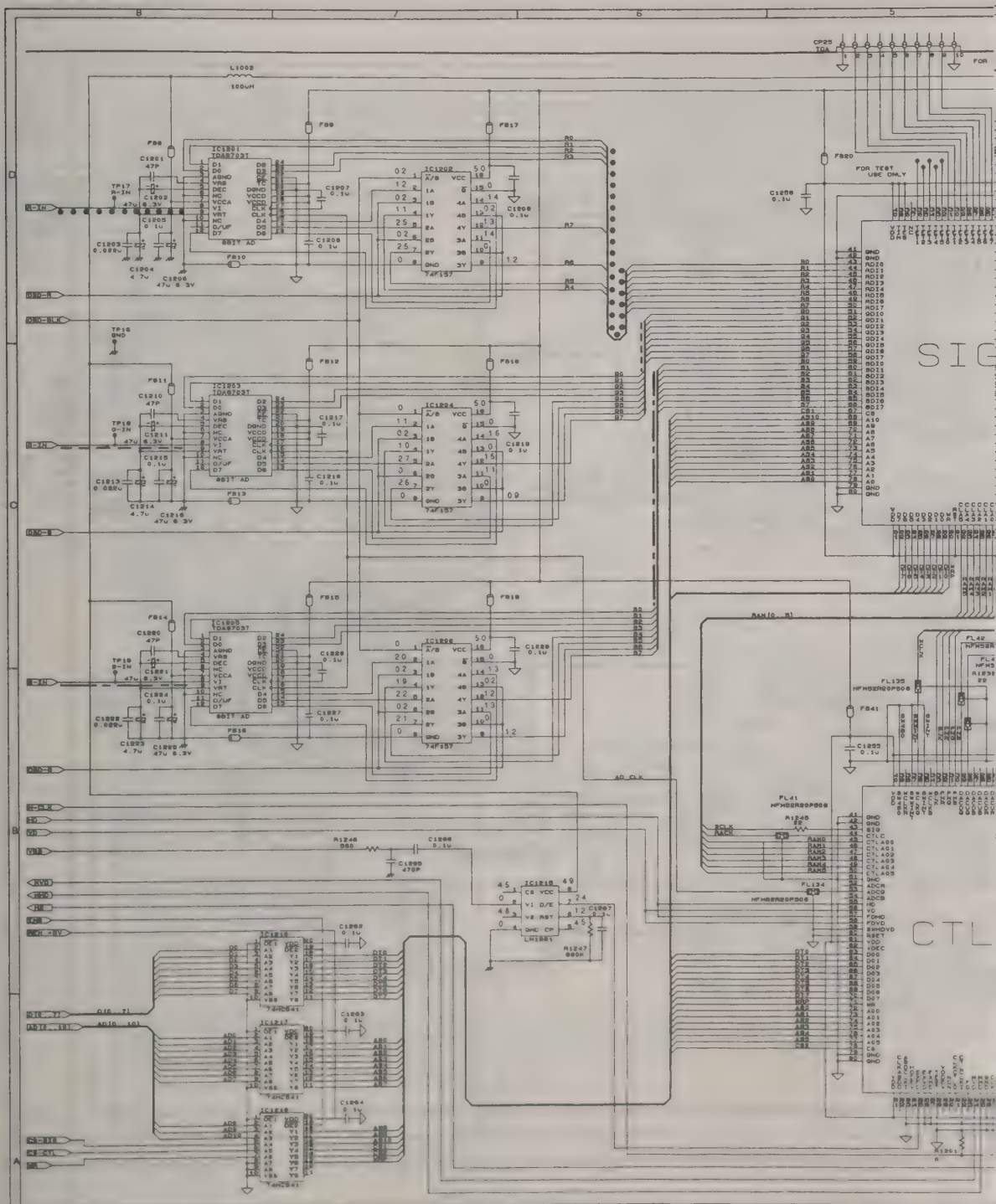
⚠SHADING ON THE SCHEMATICS.
REPLACE THESE CRITICAL COMPONENTS

WITH RECOMMENDED REPLACEMENT PARTS
DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING

MAIN PWB (2/3)



NOTES

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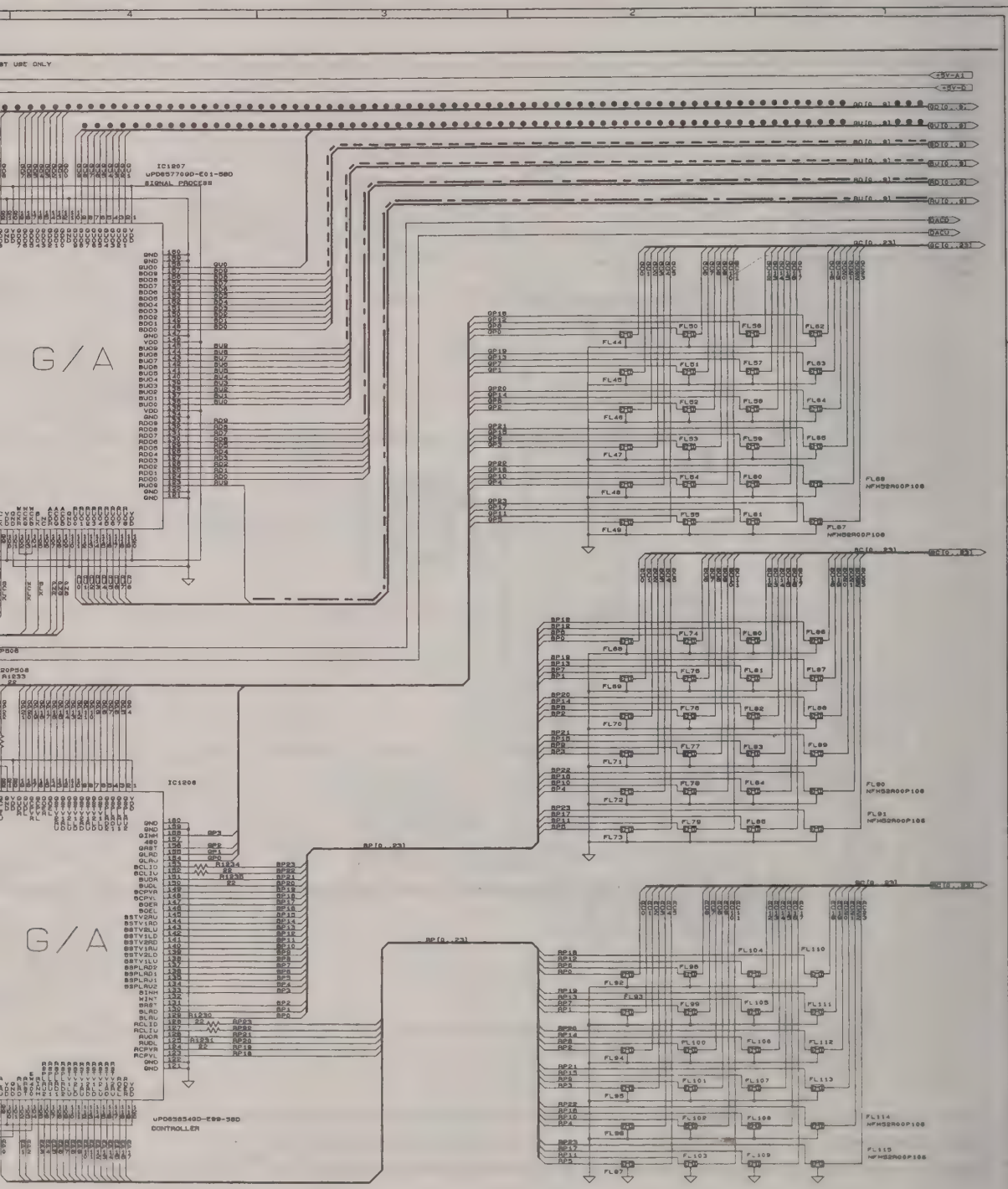
2. ALL RESISTORS ARE 1/6W, 1/8W EXCEPT WHERE OTHERWISE INDICATED
3. CAPACITOR VALUES ARE IN μF UNLESS OTHERWISE INDICATED P=PF
4. ALL CAPACITORS ARE 50VOLTS EXCEPT WHERE OTHERWISE INDICAT
5. VOLTAGES AND WAVEFORMS M SURED UNDER FOLLOWING CO TIONS
   INPUT SIGNAL IS STANDARD CO BAR CONTRAST CONTROL IS 75% A



X- CONTROL EXCEPT CONTRAST ARE
D. CENTER.
A- 6 Ⓗ HORIZONTAL RATE Ⓥ VERTICAL
DI- RATE

OR
ND

WARNING

REPLACEMENT PARTS WHICH HAVE SPECIAL SAFTY CHARACTERISTICS ARE IDENTIFIED BY
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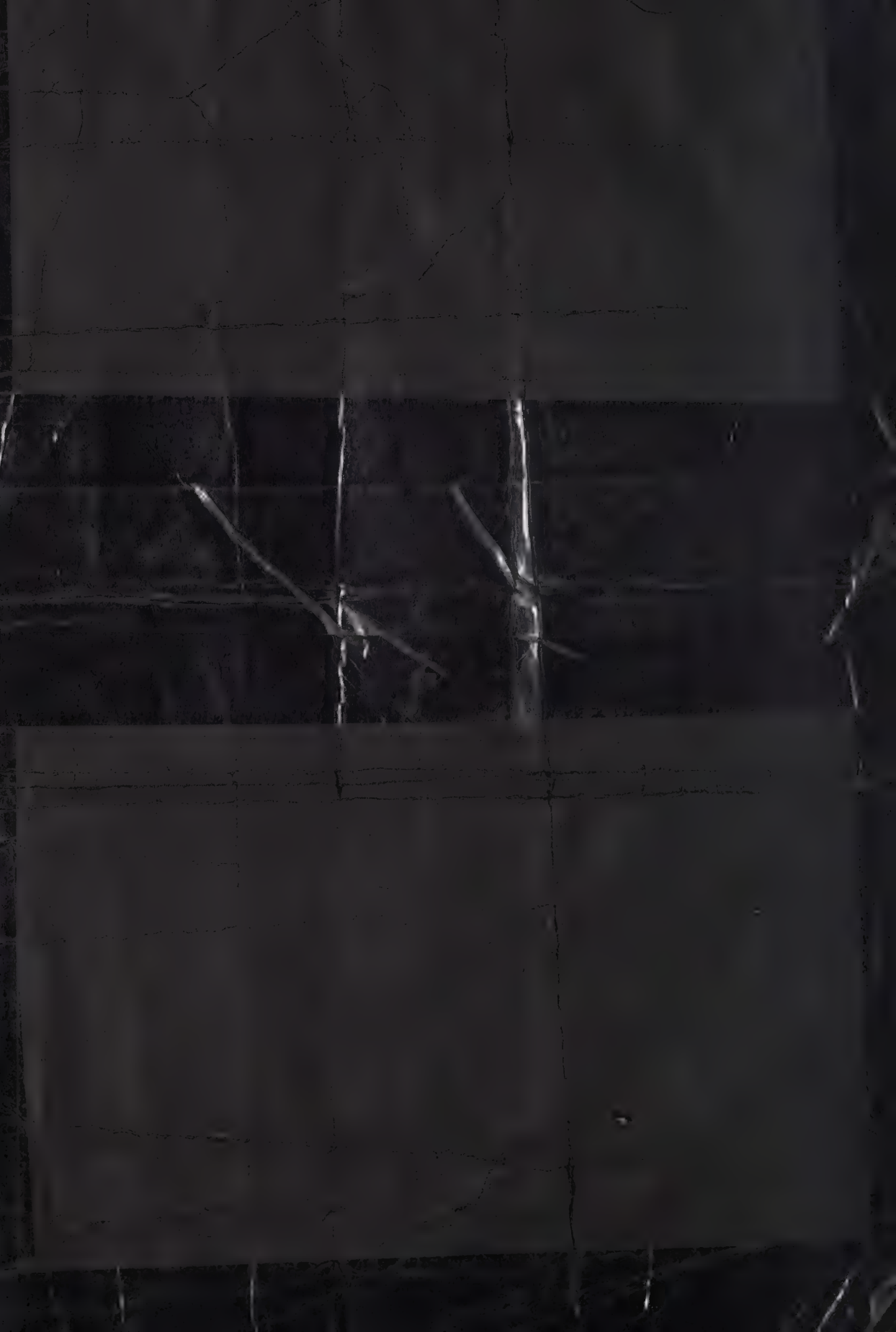
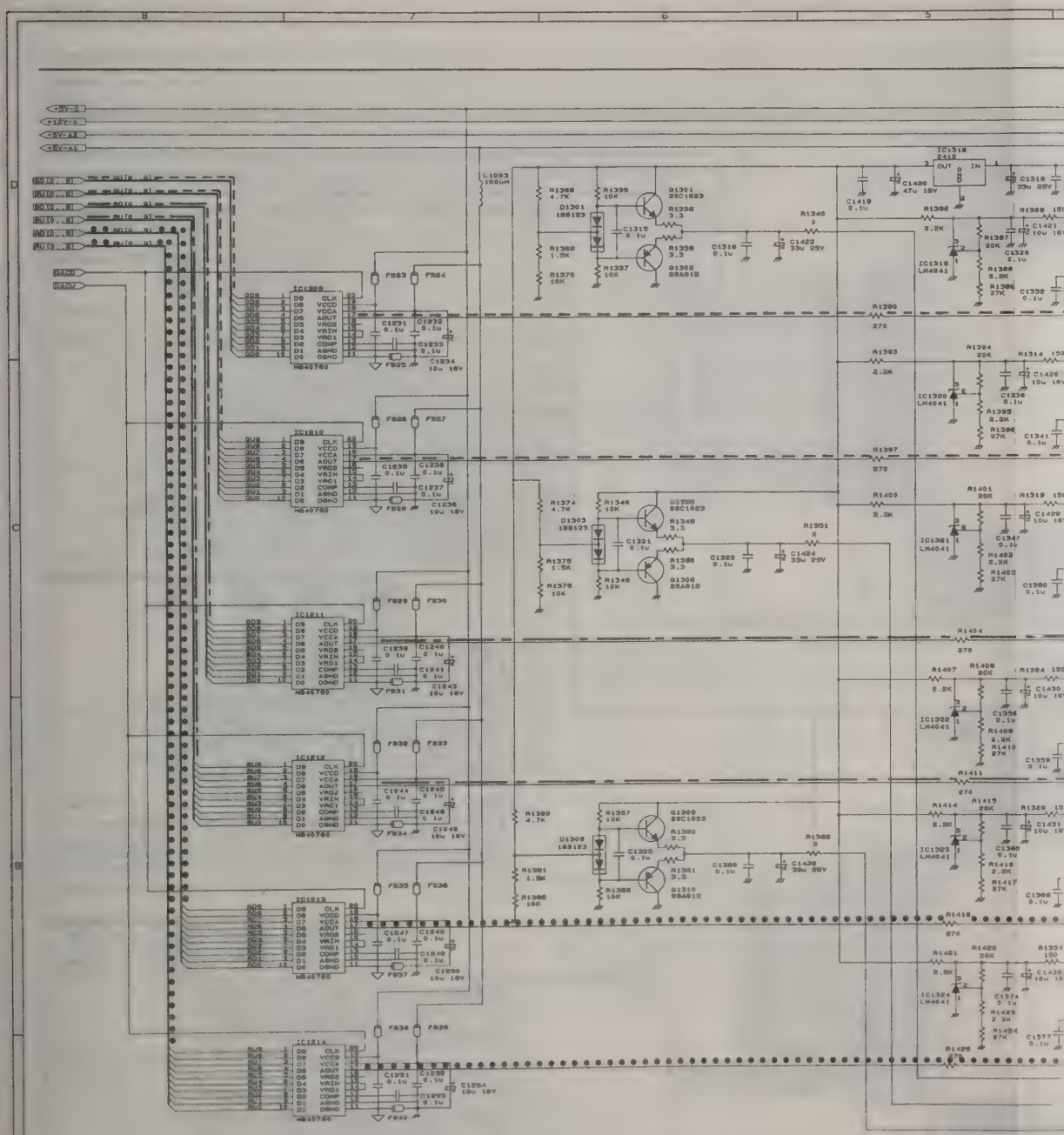
DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING

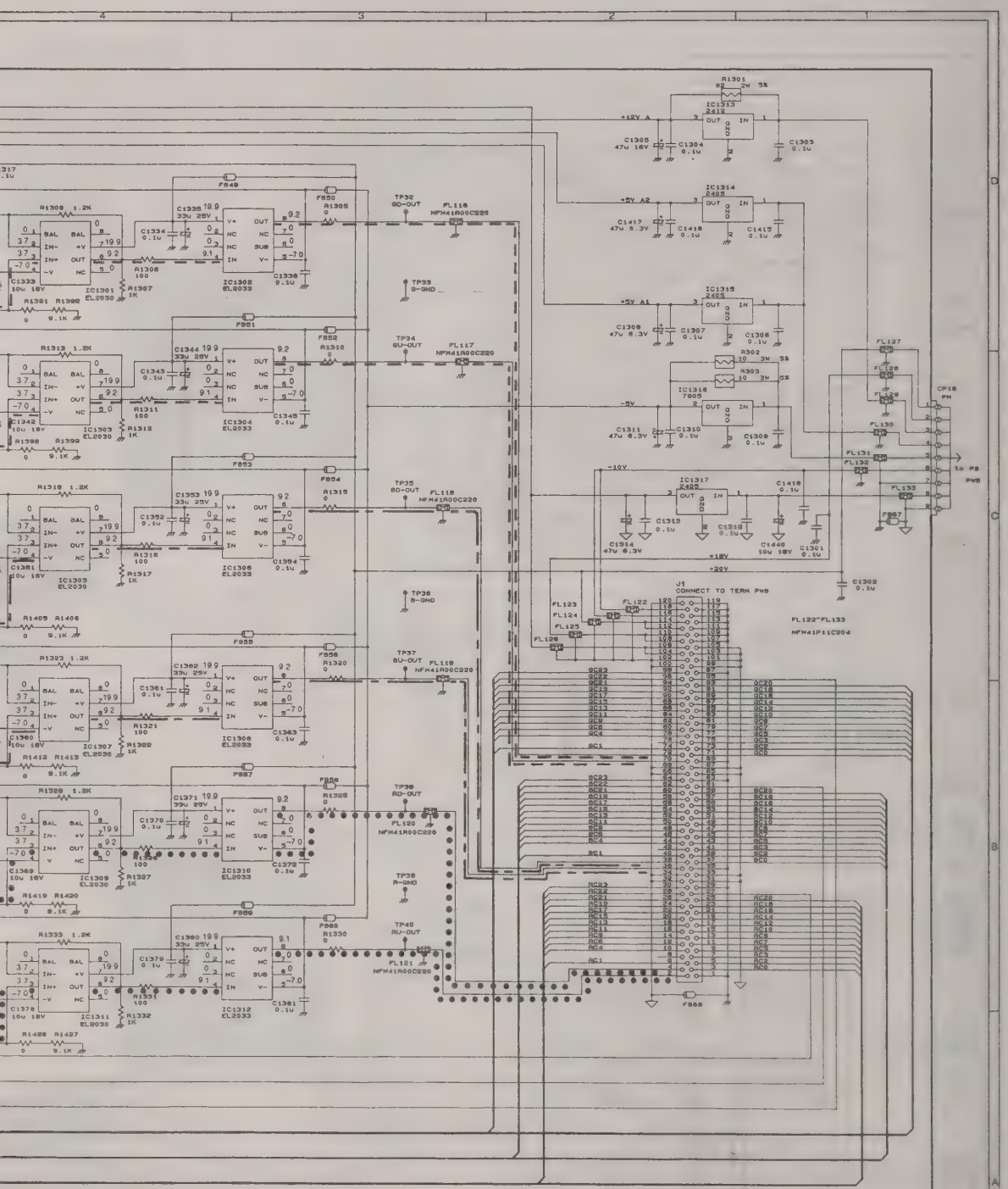


MAIN PWB (3/3)



NOTES

1. RESISTOR VALUES ARE IN Ω (OHM) K=1,000Ω M=1,000,000Ω
2. ALL RESISTORS ARE 1/6W 1/8W EXCEPT WHERE OTHERWISE INDICATED
3. CAPACITOR VALUES ARE IN μF U OTHERWISE INDICATED P=PF
4. ALL CAPACITORS ARE 50VOLTS WHERE OTHERWISE INDICATED
5. VOLTAGES AND WAVEFORMS MEA UNDER FOLLOWING CONDITIONS



LESS
CEPT
URED

INPUT SIGNAL IS STANDARD COLOR BAR CONTRAST CONTROL IS 75% AND CONTROL EXCEPT CONTRAST ARE CENTER.

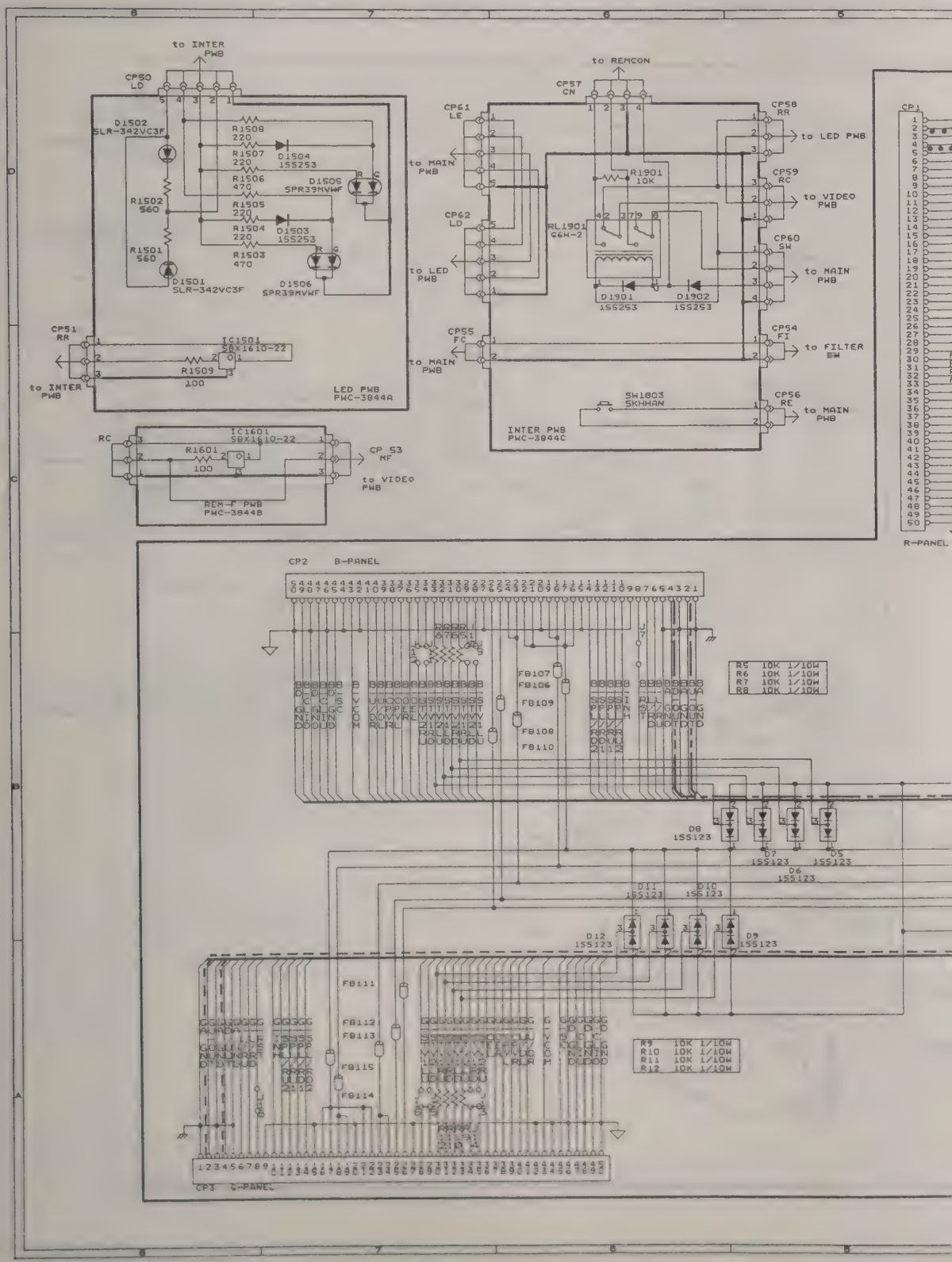
6. Ⓗ.... HORIZONTAL RATE. Ⓥ.... VERTICAL RATE.

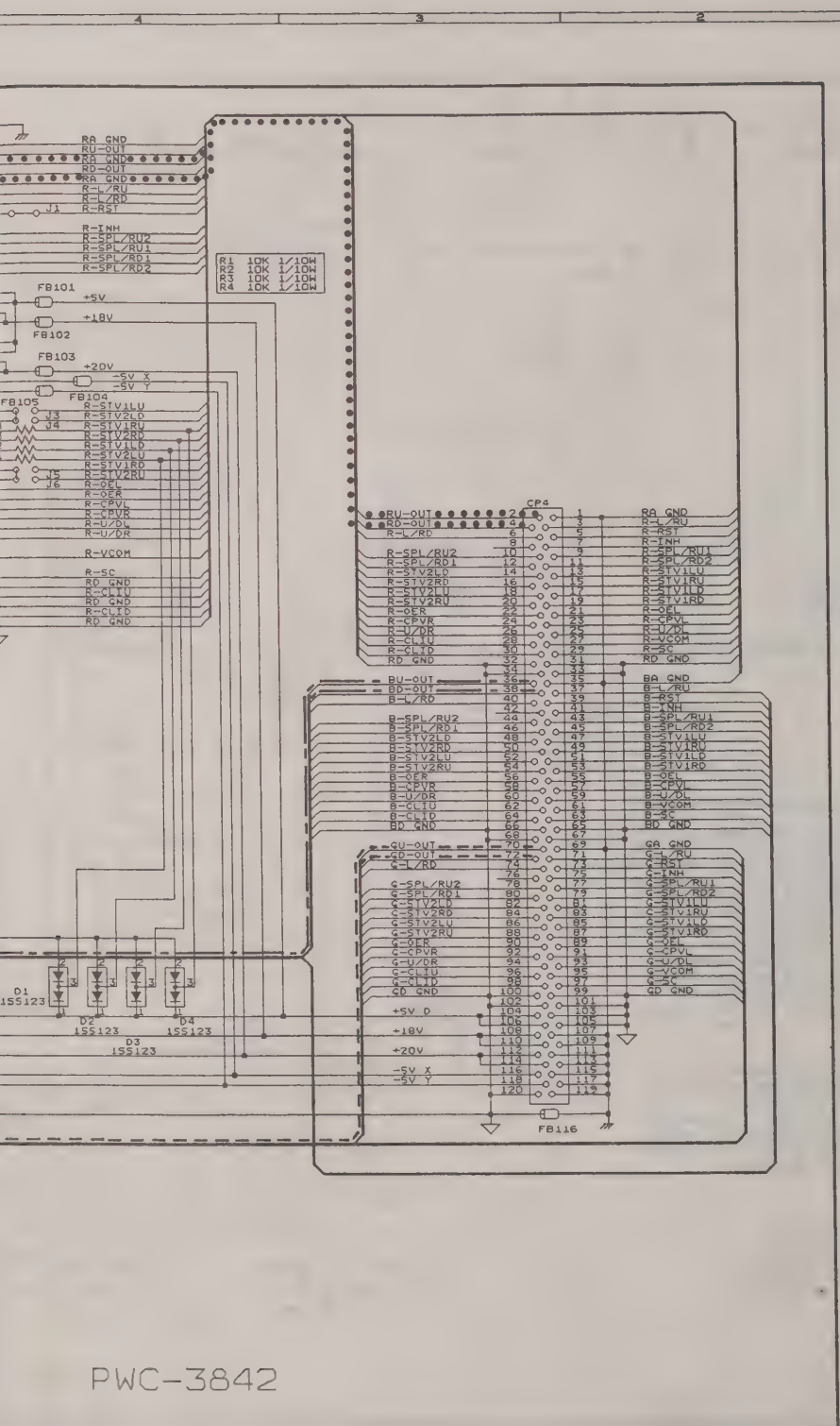
WARNING

REPLACEMENT PARTS WHICH HAVE SPECIAL SAFTY CHARACTERISTICS ARE IDENTIFIED BY ⚠SHADING ON THE SCHEMATICS.

REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS. DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

TERM PWB (PWC-3842)





PWC-3842

NOTES

1. RESISTOR VALUES ARE IN Ω (OHM) K=1,000Ω M=1,000,000Ω
2. ALL RESISTORS ARE 1/6W, 1/8W EXCEPT WHERE OTHERWISE INDICATED
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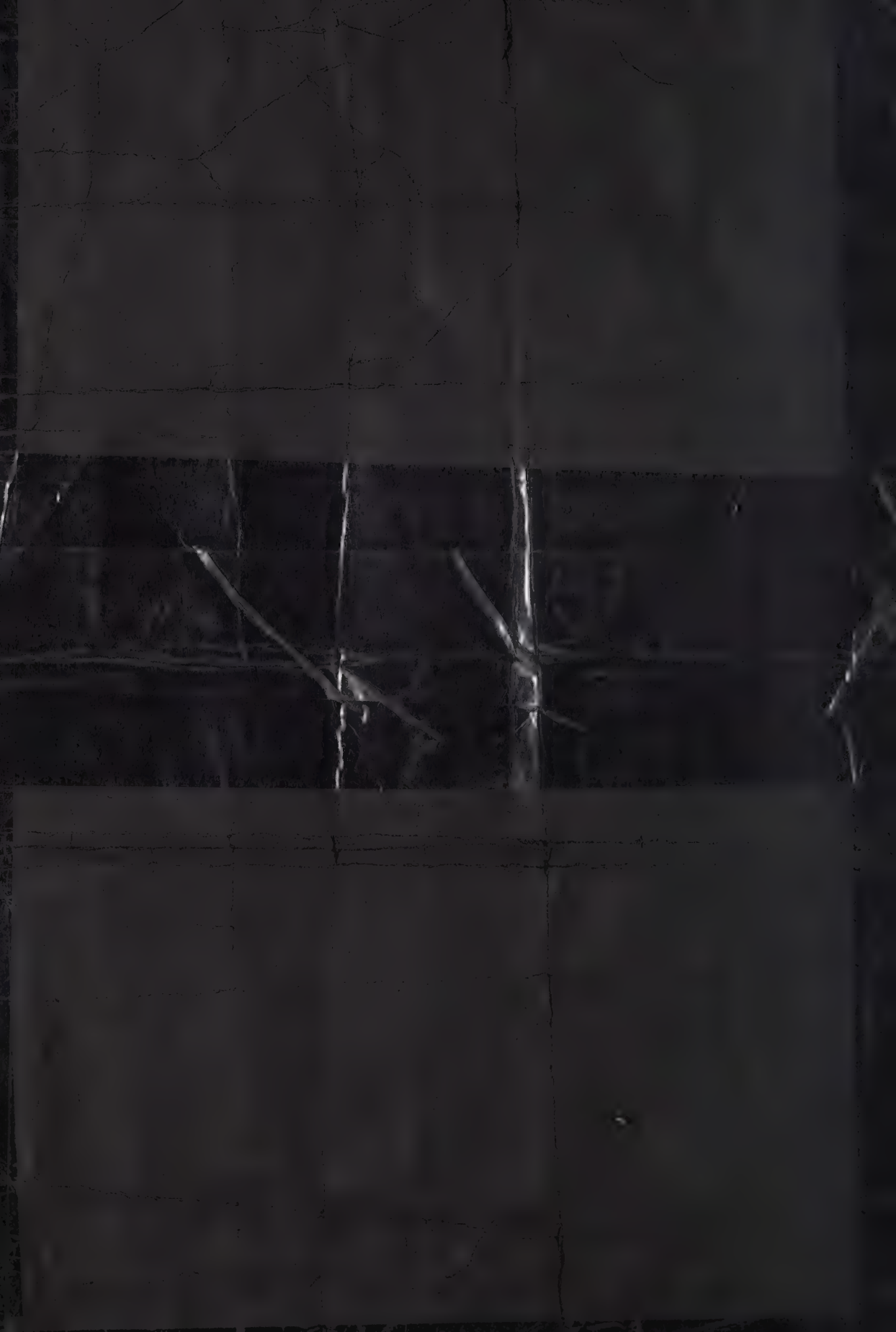
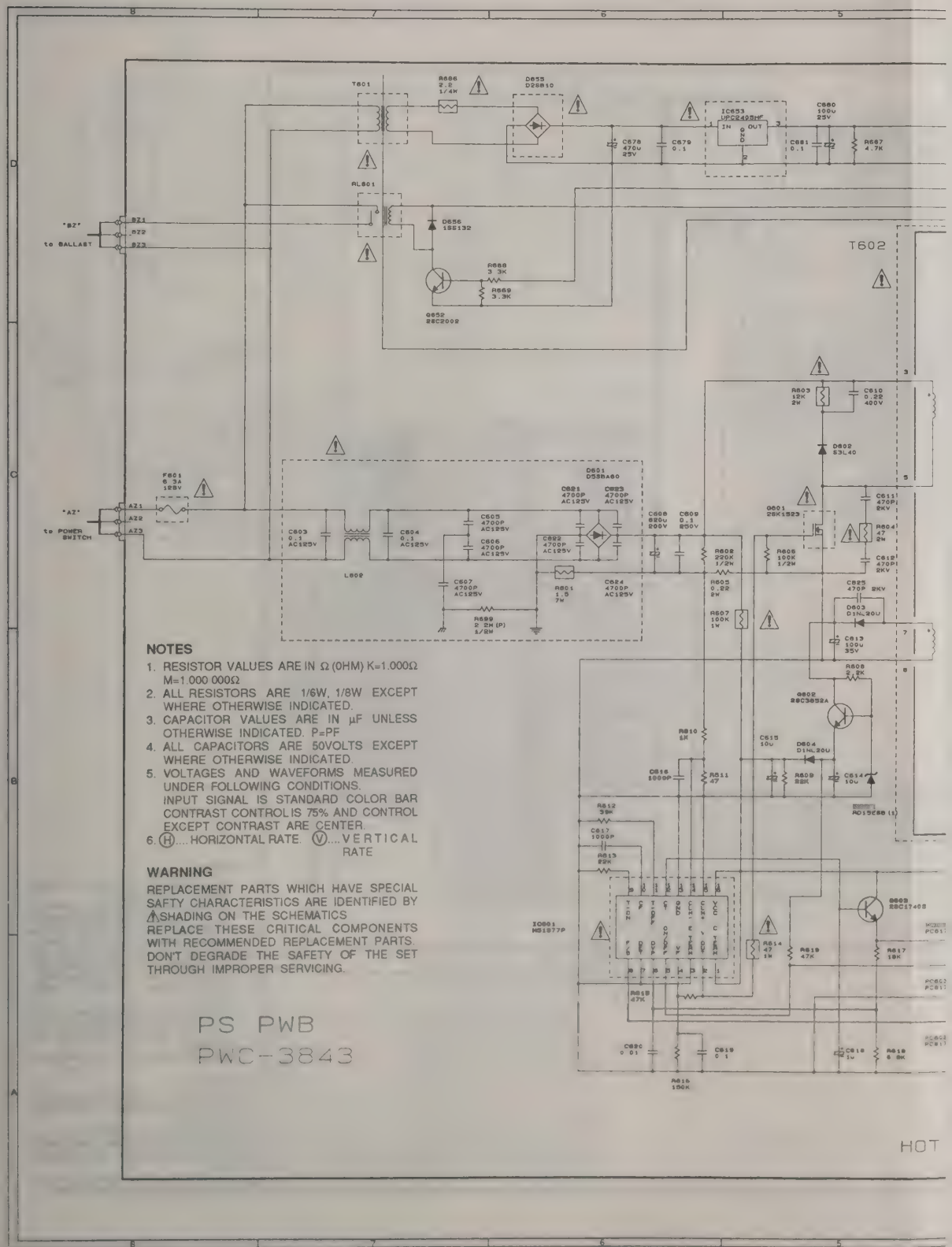
   INPUT SIGNAL IS STANDARD COLOR BAR CONTRAST CONTROL IS 75% AND CONTROL EXCEPT CONTRAST ARE CENTER.
6. Ⓗ... HORIZONTAL RATE. Ⓥ... VERTICAL RATE

WARNING

REPLACEMENT PARTS WHICH HAVE SPECIAL SAFTY CHARACTERISTICS ARE IDENTIFIED BY
⚠SHADING ON THE SCHEMATICS
REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS
DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING



PS PWB (Only LCD MT)



NOTES

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6. Ⓗ....HORIZONTAL RATE. Ⓥ....VERTICAL RATE

WARNING

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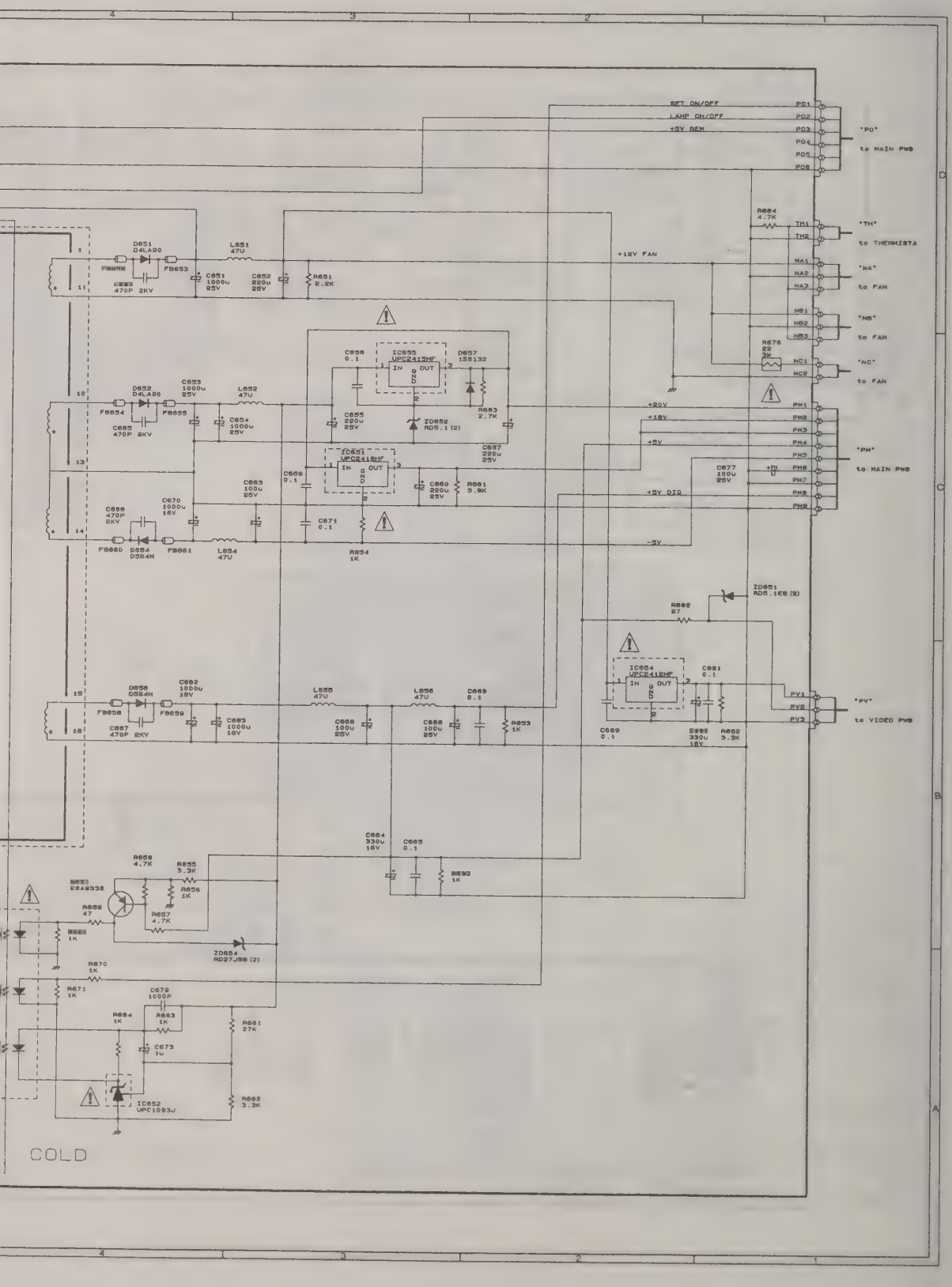
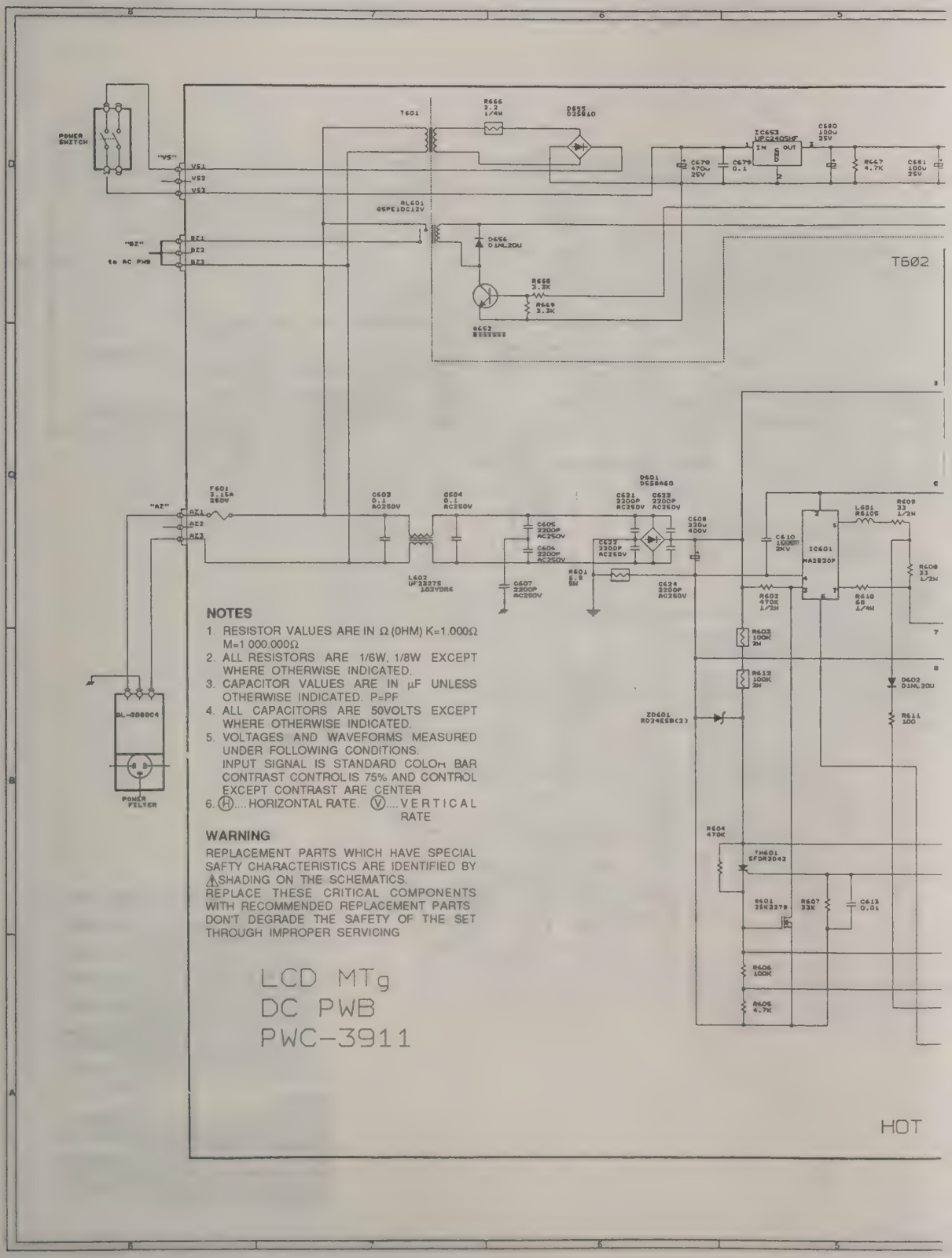
DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

PS PWB
PWC-3843

HOT


SET ON/OFF
LAMP ON/OFF
+5V REM
PO1
PO2
PO3
PO4
PO5
PO6
"PO"
to MAIN PWB
R684
4.7K
TH1
TH2
"TH"
to THERMISTA
+12V FAN
NA1
NA2
NA3
"NA"
to FAN
NB1
NB2
NB3
"NB"
to FAN
R676
22
3W
NC1
NC2
"NC"
to FAN
D651
D4LA20
L651
47U
FB653
C651
1000u
25V
C652
220u
25V
R651
2.2K
470P 2KV
IC655
UPC2415HF
IN
OUT
GND
C656
0.1
D657
1SS132
C655
220u
25V
ZD652
RD5.1 (2)
R653
2.7K
C654
1000u
25V
D652
D4LA20
FB654
FB655
C653
1000u
25V
L652
47U
C685
470P 2KV
C687
220u
25V
IC651
UPC2410HF
C659
0.1
C660
220u
25V
R661
3.9K
C663
100u
25V
C670
1000u
16V
C671
0.1
R654
1K
C658
470P
2KV
FB660
D654
DS84M
FB661
L654
47U
+20V
+18V
+5V
+5V DIR
-5V
PM1
PM2
PM3
PM4
PM5
PM6
PM7
PM8
PM9
"PM"
to MAIN PWB
C677
100u
25V
+IN
ZD651
RD5.1EB (2)
R682
27
IC654
UPC2412HF
C691
0.1
C689
0.1
R692
3.3K
330u
16V
PV1
PV2
PV3
"PV"
to VIDEO PWB
D656
DS84M
FB656
FB659
C662
1000u
16V
C683
1000u
16V
C687
470P 2KV
L655
47U
L656
47U
C669
0.1
C686
100u
25V
C688
100u
25V
R653
1K
C664
330u
16V
C665
0.1
R693
1K
R658
4.7K
R655
3.3K
2SA933S
R656
1K
R659
47
R657
4.7K
ZD654
RD27JSB (2)
R670
1K
R671
1K
C672
1000P
R664
1K
R663
1K
R661
27K
C673
1u
IC652
UPC1093J
R662
3.3K
COLD

DC PWB (Only LCD MTg)



NOTES

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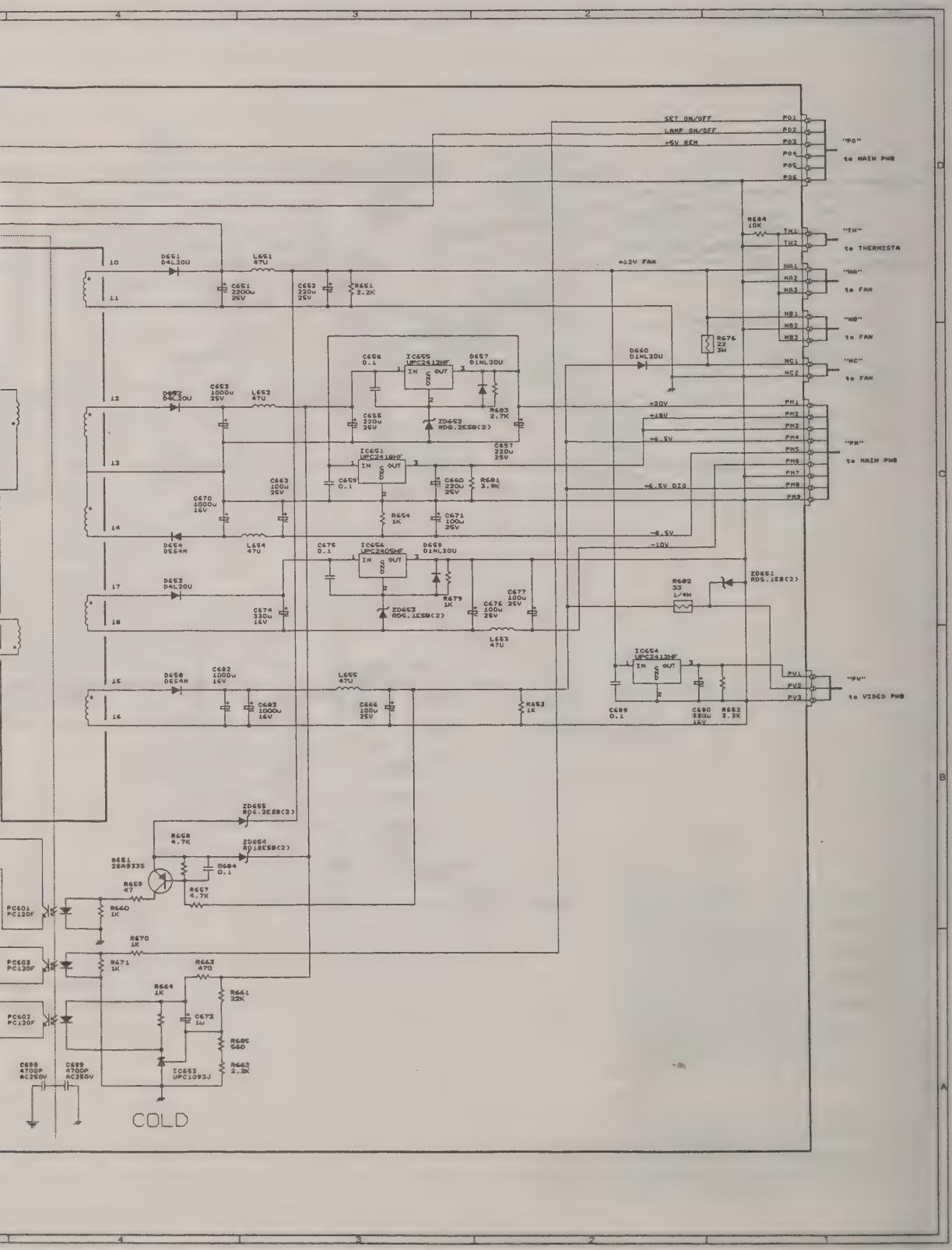
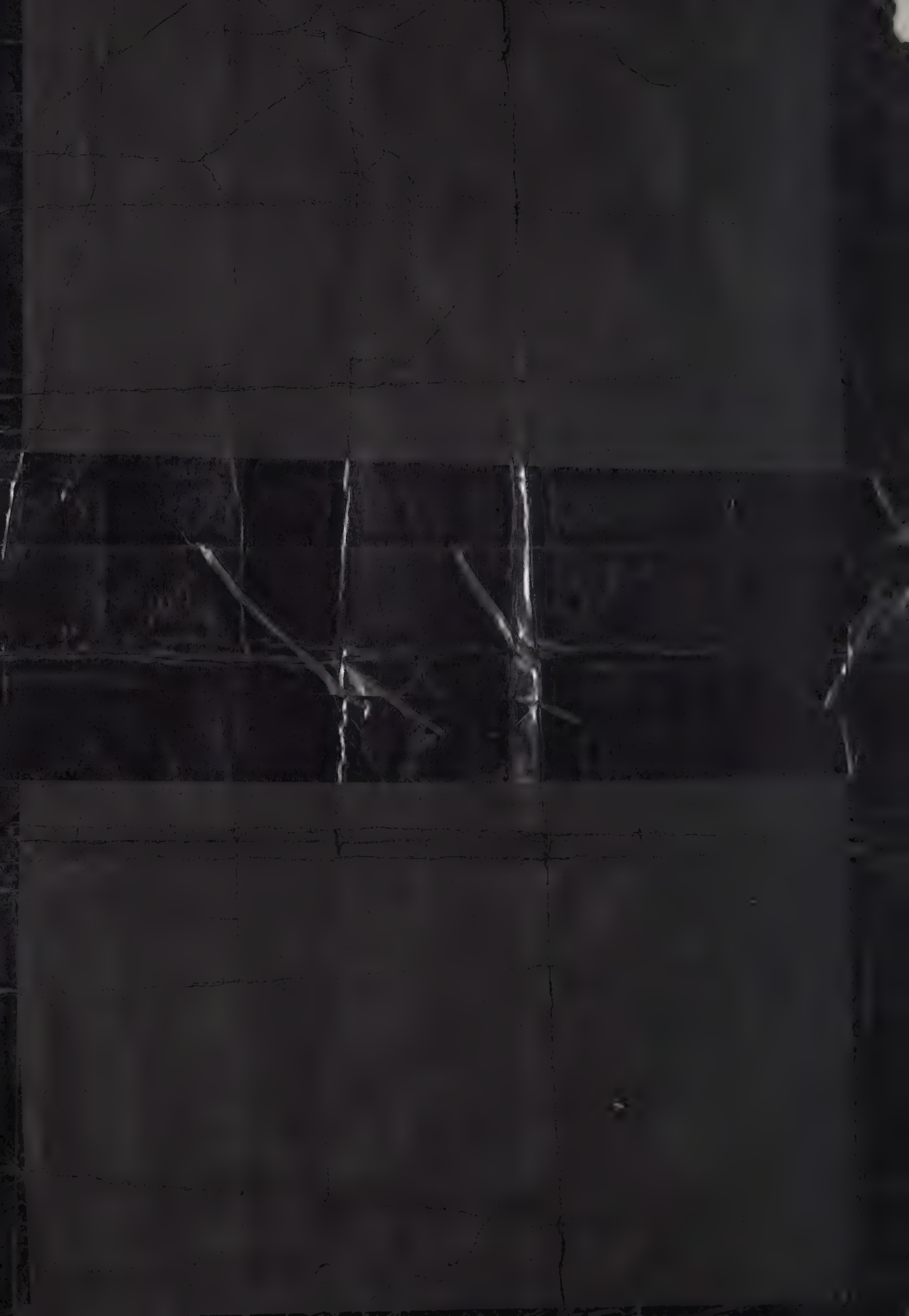
3. CAPACITOR VALUES ARE IN μF UNLESS OTHERWISE INDICATED. P=PF
4. ALL CAPACITORS ARE 50VOLTS EXCEPT WHERE OTHERWISE INDICATED.
5. VOLTAGES AND WAVEFORMS MEASURED UNDER FOLLOWING CONDITIONS. INPUT SIGNAL IS STANDARD COLOR BAR CONTRAST CONTROL IS 75% AND CONTROL EXCEPT CONTRAST ARE CENTER
6. (H)....HORIZONTAL RATE. (V)....VERTICAL RATE

WARNING

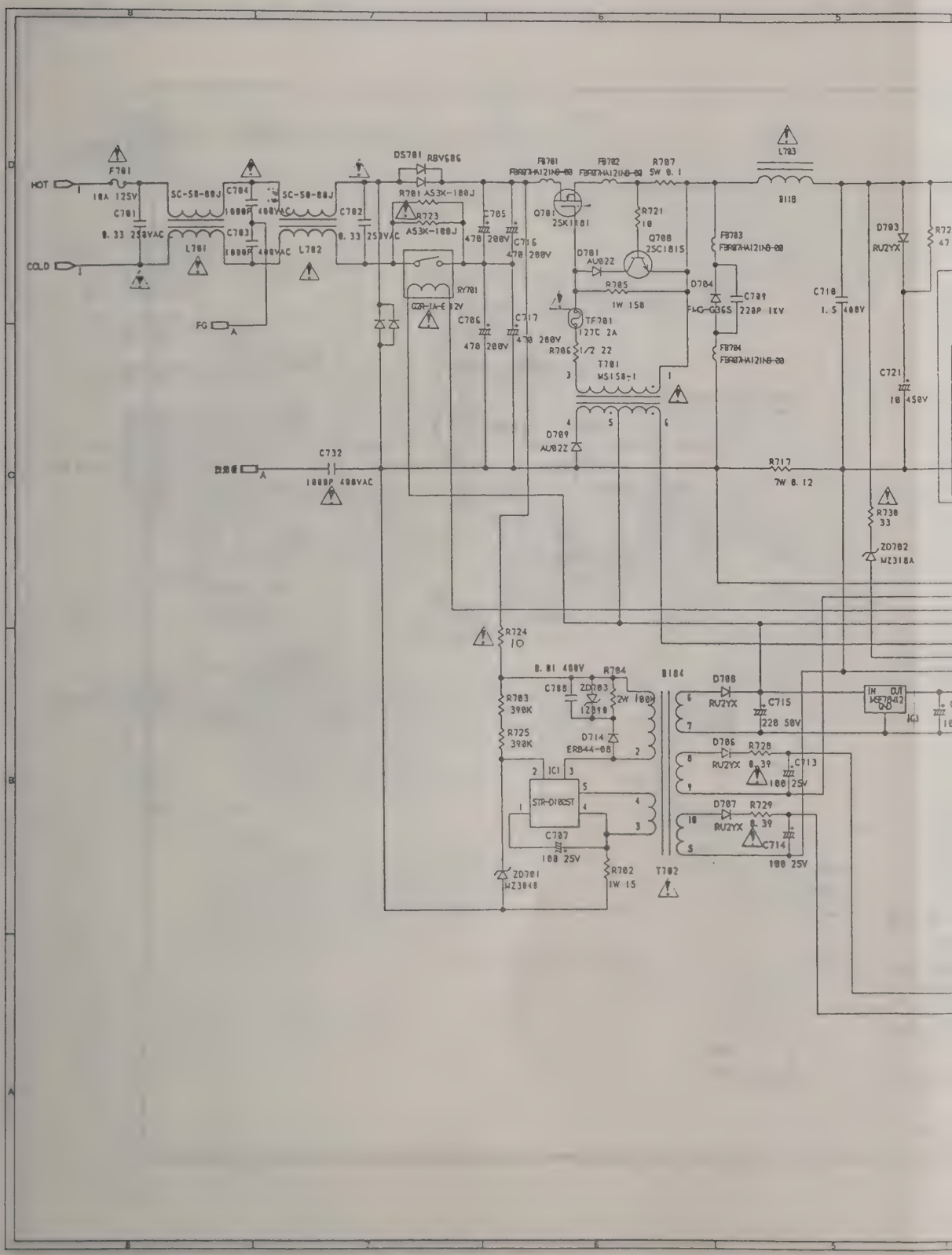
REPLACEMENT PARTS WHICH HAVE SPECIAL SAFTY CHARACTERISTICS ARE IDENTIFIED BY ⚠SHADING ON THE SCHEMATICS.
REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING

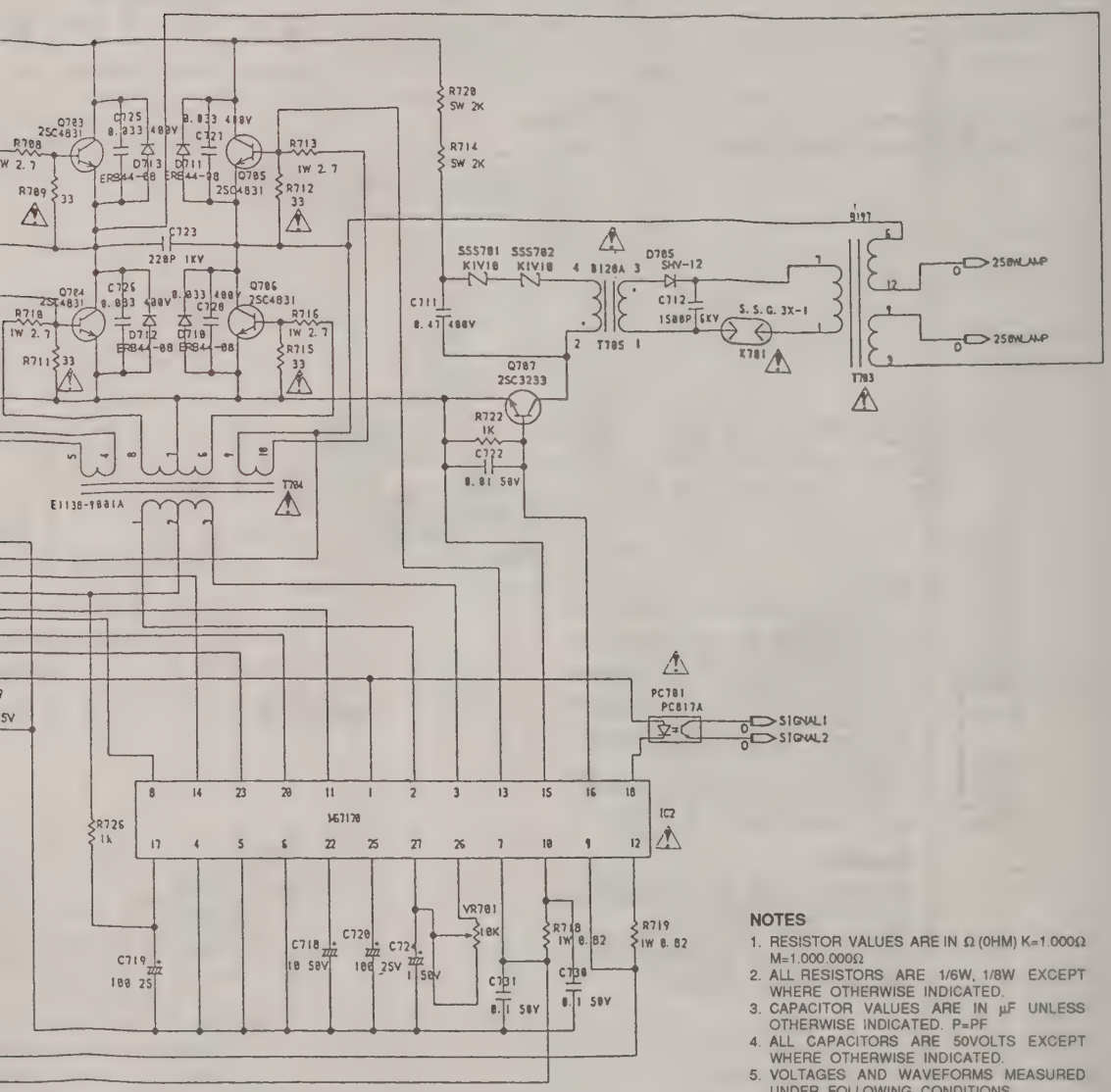
LCD MTg
DC PWB
PWC-3911


SET ON/OFF
LAMP ON/OFF
+5V REM
"PO"
to MAIN PWB
R684 10K
"TH"
to THERMISTA
+12V FAN
"NA"
to FAN
"NB"
to FAN
R676 22 3W
"NC"
to FAN
+20V
+18V
+6.5V
"PA"
to MAIN PWB
+6.5V DIG
-8.5V
-10V
ZD651 RD5.1ESB(2)
R682 3.3K
"PV"
to VIDEO PWB
ZD655 RD6.2ESB(2)
ZD654 RD18ESB(2)
R658 4.7K
R657 4.7K
R659 47
R660 1K
R670 1K
R671 1K
R663 470
R664 1K
R661 22K
R685 560
R662 2.2K
C698 4700P AC250V
C699 4700P AC250V
IC652 UPC1093J
COLD



LAMP PS PWB (Only LCD MT)





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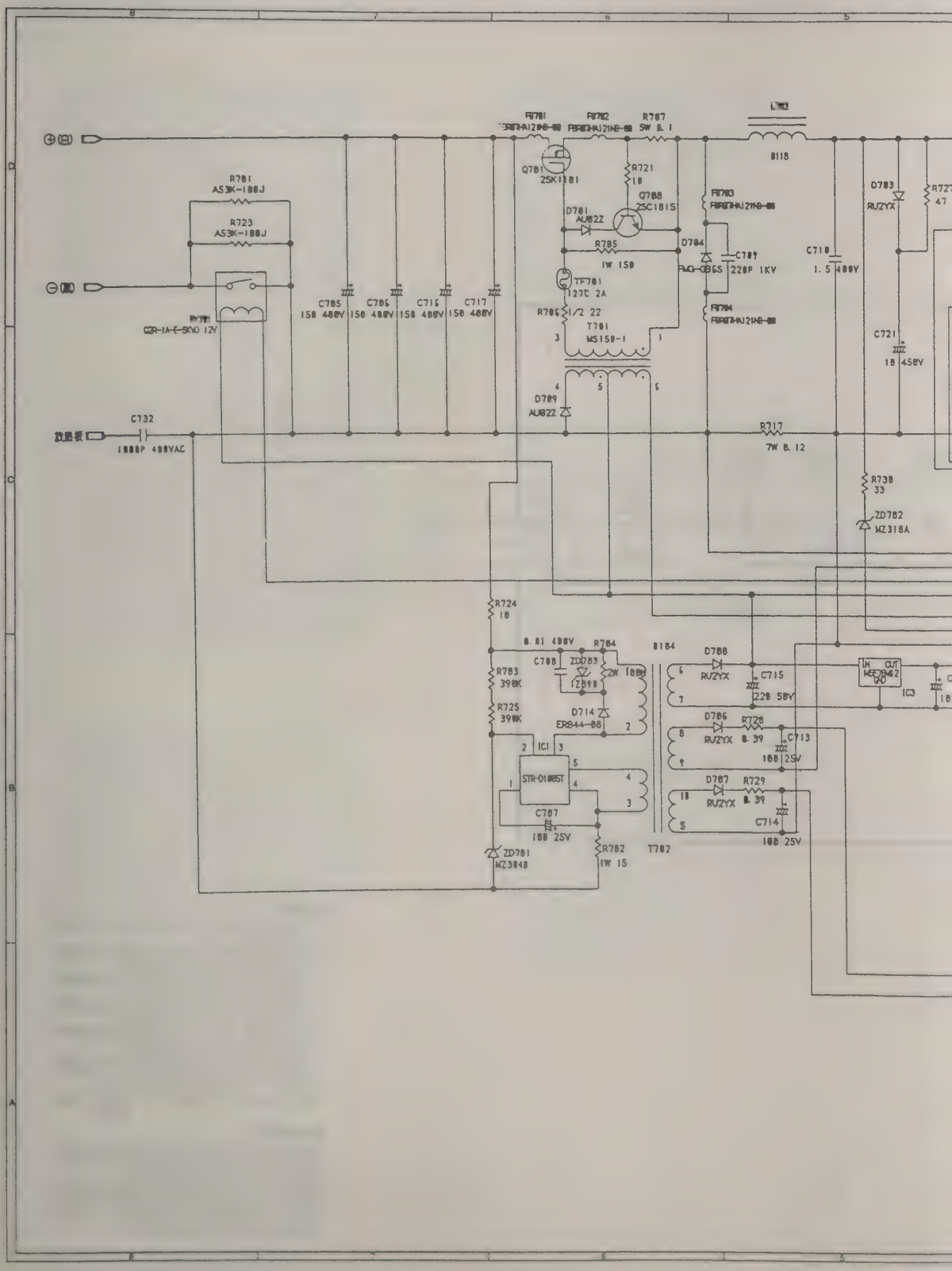
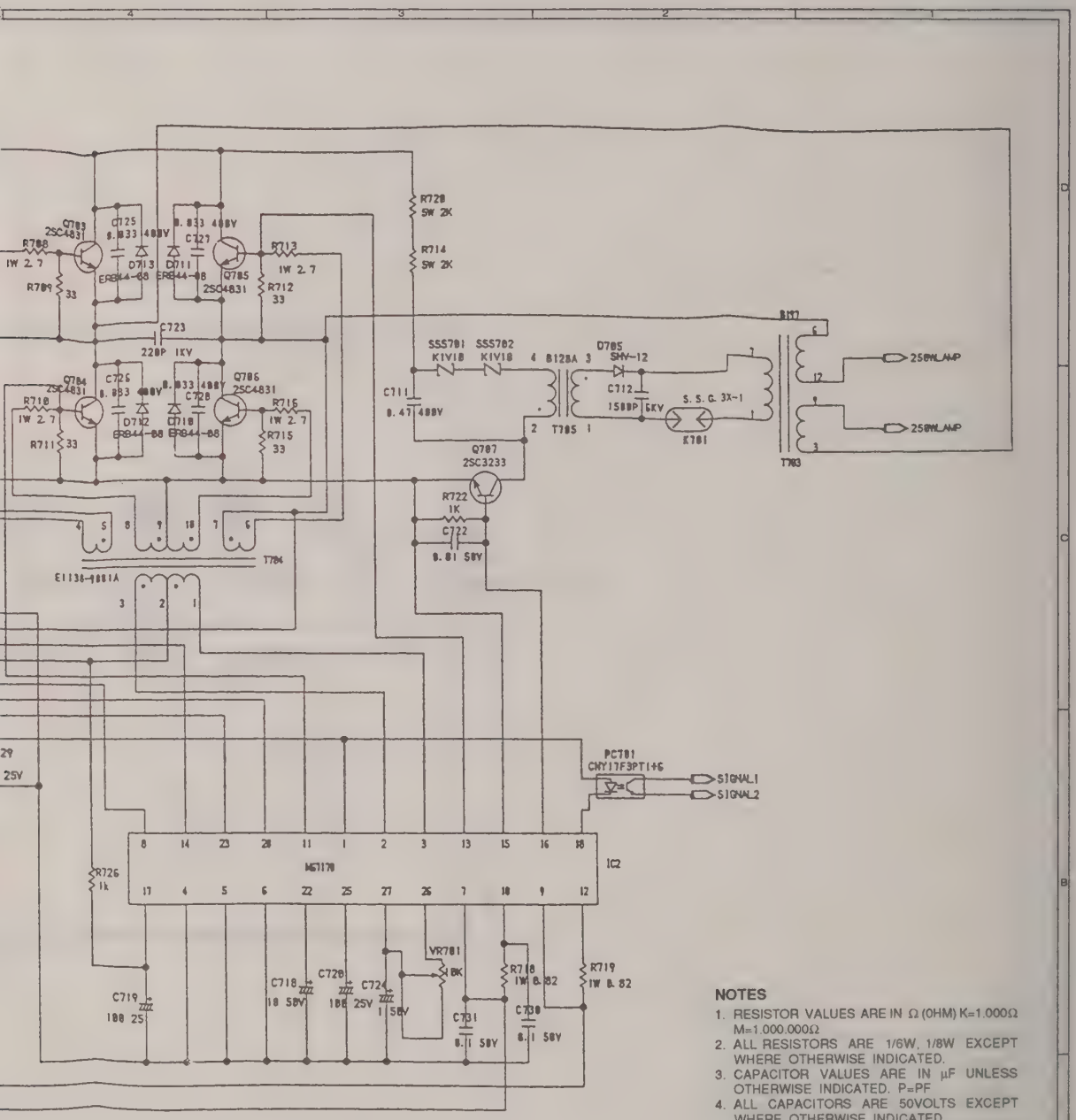
5. VOLTAGES AND WAVEFORMS MEASURED UNDER FOLLOWING CONDITIONS
   INPUT SIGNAL IS STANDARD COLOR BAR
   CONTRAST CONTROL IS 75% AND CONTROL EXCEPT CONTRAST ARE CENTER.
6. Ⓗ....HORIZONTAL RATE. Ⓥ....VERTICAL RATE.

WARNING

REPLACEMENT PARTS WHICH HAVE SPECIAL SAFTY CHARACTERISTICS ARE IDENTIFIED BY ⚠SHADING ON THE SCHEMATICS.
REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

LAMP PS PWB (Only LCD MTg)





NOTES

1. RESISTOR VALUES ARE IN Ω (OHM) K=1.000Ω M=1.000.000Ω
2. ALL RESISTORS ARE 1/6W, 1/8W EXCEPT WHERE OTHERWISE INDICATED.
3. CAPACITOR VALUES ARE IN μF UNLESS OTHERWISE INDICATED. P=PF
4. ALL CAPACITORS ARE 50VOLTS EXCEPT WHERE OTHERWISE INDICATED.
5. VOLTAGES AND WAVEFORMS MEASURED UNDER FOLLOWING CONDITIONS. INPUT SIGNAL IS STANDARD COLOR BAR CONTRAST CONTROL IS 75% AND CONTROL EXCEPT CONTRAST ARE CENTER.
6. Ⓗ.... HORIZONTAL RATE. Ⓥ.... VERTICAL RATE.

WARNING

REPLACEMENT PARTS WHICH HAVE SPECIAL SAFTY CHARACTERISTICS ARE IDENTIFIED BY ⚠SHADING ON THE SCHEMATICS.
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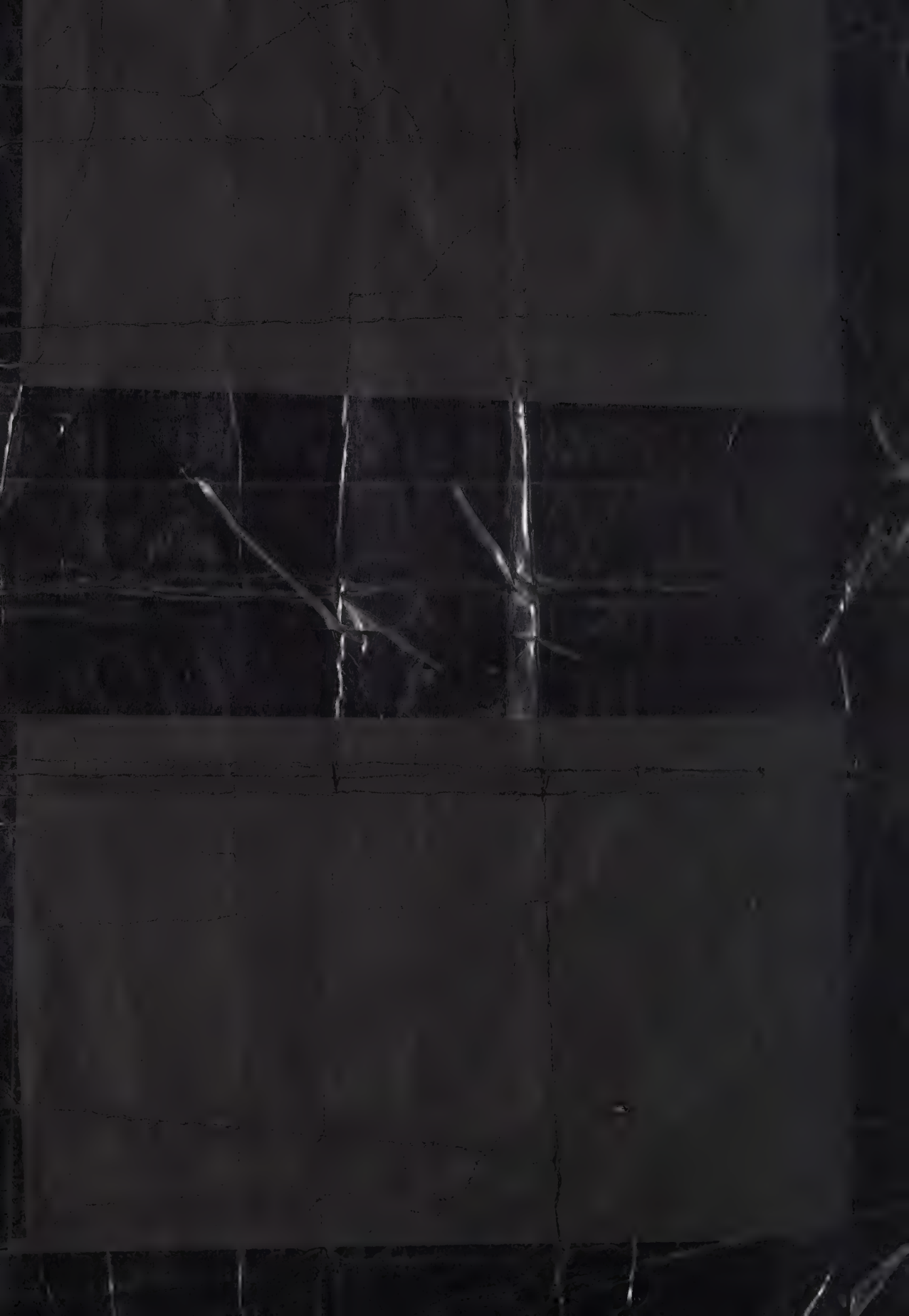
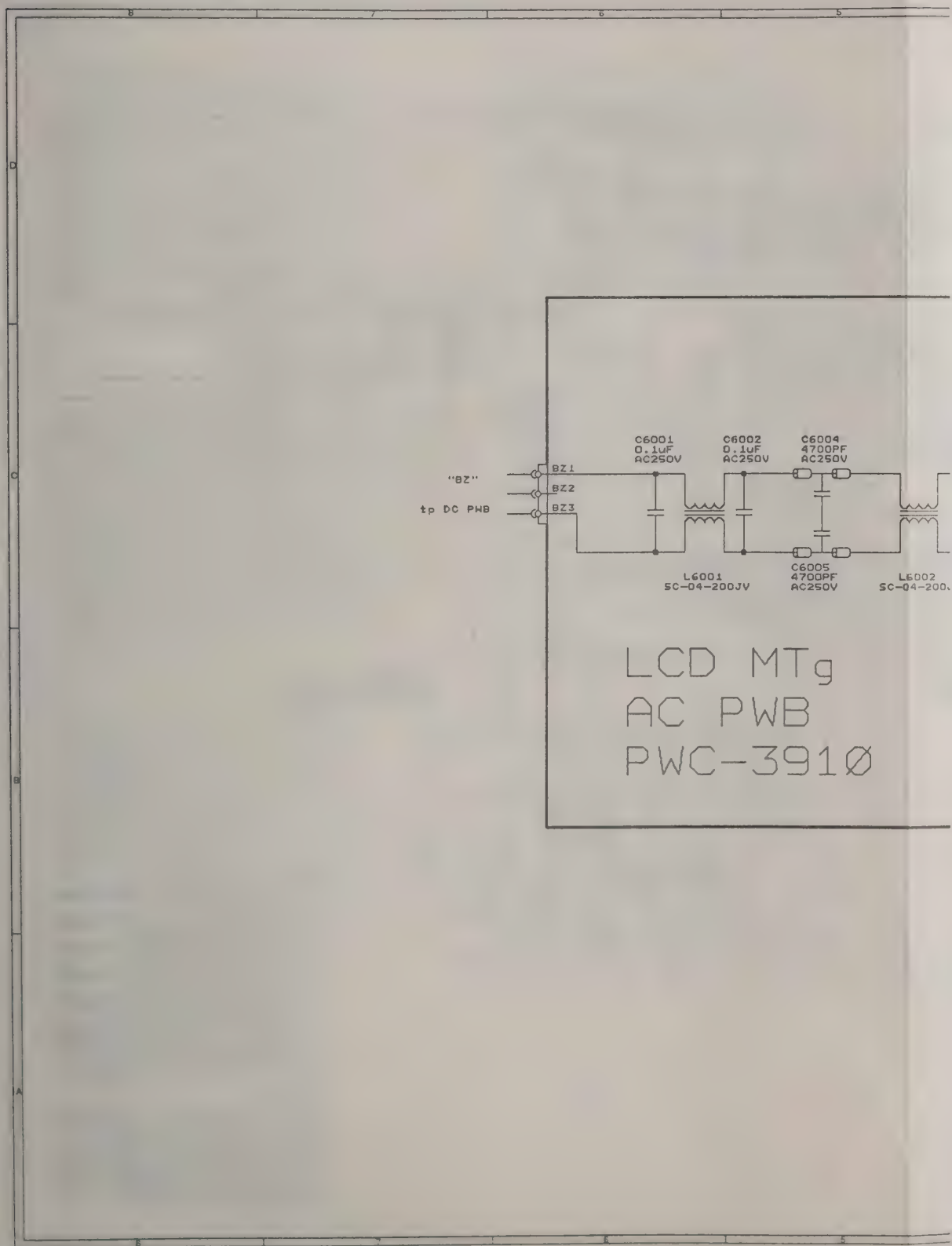
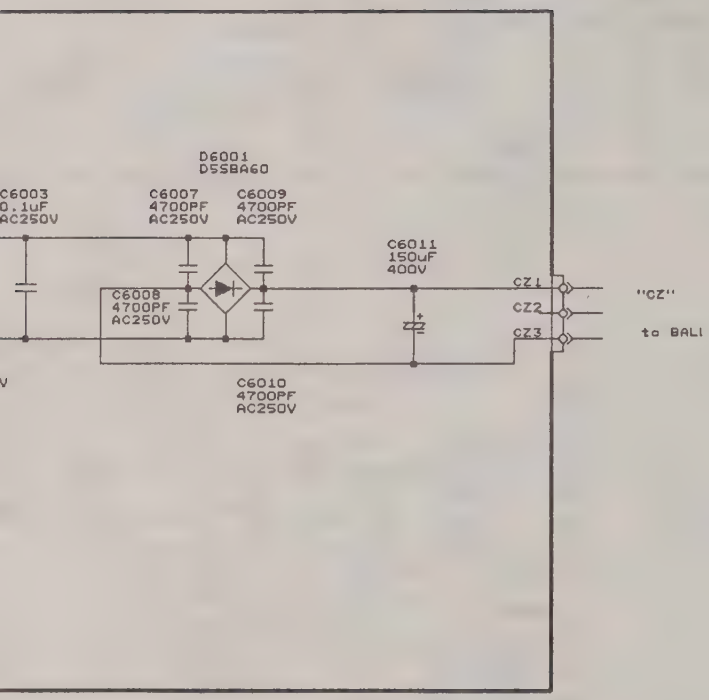
DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.



AC PWB (Only LCD MTg)





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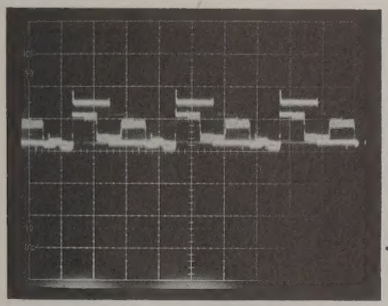
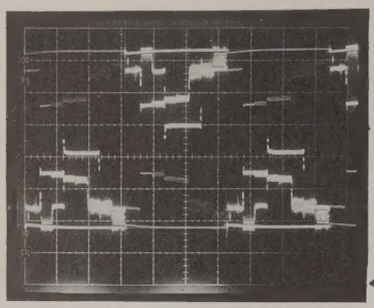
WAVE FORM

MAIN PWB



TP17



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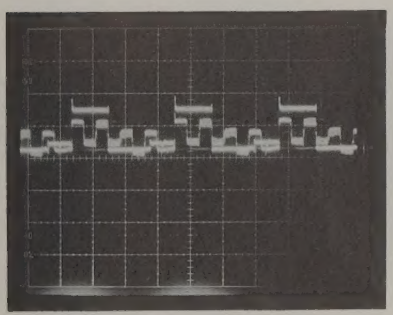

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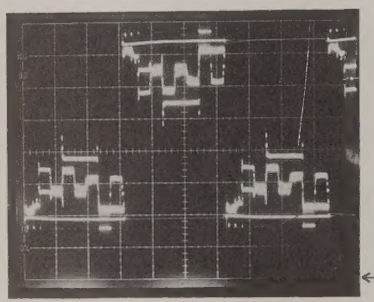

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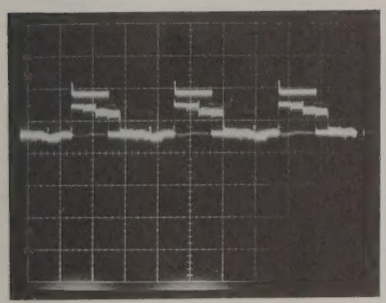

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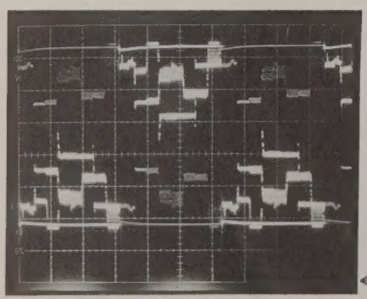

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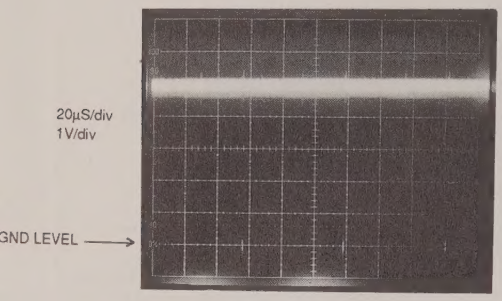
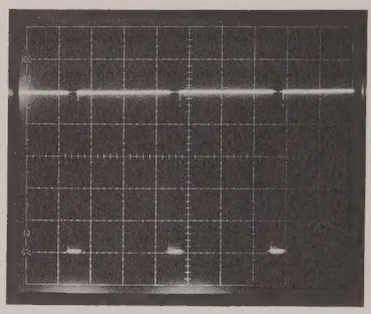
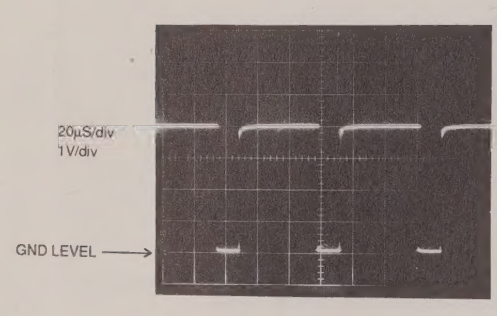


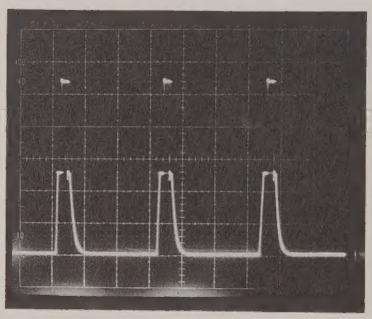
TP1



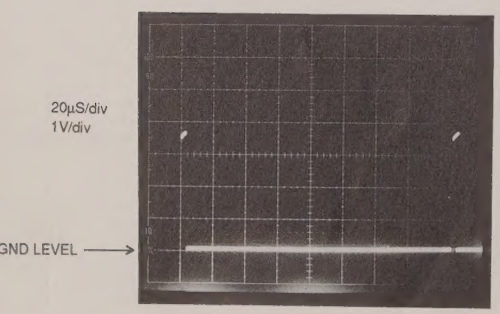
IC7006



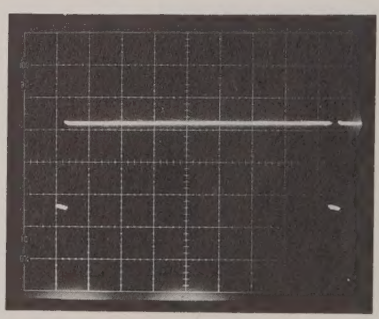
TP41



IC7009



TP42



IC7009

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